

**NEWS RELEASE LOG**

<b>NUMBER</b>	<b>TITLE</b>	<b>RELEASE DATE</b>
80-001	NASA Extends Boeing Safety/Quality Support Contract	01/10/80
80-002	Symposium on Women in Aerospace to Take Place at JSC March 12-13	01/16/80
80-003	30-Hour Simulation	01/21/80
80-004	Martin Receives TPS Repair Contract	01/22/80
80-005	IBM Awarded Contract for Orbiter Data Processor Maintenance	01/25/80
80-006	Black History Month Program Set for JSC February 15	02/05/80
80-007	NASA Begins Screening Astronaut Applicants	02/20/80
80-008	"Women in Aviation and Space" Symposium March 12 & 13	02/25/80
80-009	NASA Symposium '80 to Be Held at Kelly Air Force Base	02/27/80
80-010	Lunar and Planetary Conference Will Be March 17-21 in Houston	02/26/80
80-011	NASA Develops System for Heat Treatment of Cancer	03/03/80
80-012	NASA Signs Martin Marietta to Build Manned Maneuvering Unit	02/29/80
80-013	NASA Interviews Second Group of Astronaut Applicants	03/04/80
80-014	NASA Extends Lockheed White Sands Contract	03/05/80
80-015	Portrait of Goddard Unveiling March 17, 80 at Space Center Marks 54th Anniversary of Rocket	03/10/80
80-016	Laboratory at Space Center Tests and Retests Shuttle Avionics Systems	03/20/80
80-017	NASA Screens Third Astronaut Applicant Group	03/20/80
80-018	Boeing Awarded SOC Contract	03/21/80
80-019	Space Center Screens Fourth Group of Astronaut Applicants	04/2/80
80-020	Gossamer Albatross Craft to Be on Display at Space Center April 3-28	04/01/80
80-021	First Shuttle Crew Trains for Parachute Water Landings	04/11/80
80-022	NASA Satellite to Aid Timber Industry in Managing Forest Lands	04/10/80
80-023	NASA Signs Canadians to Build Shuttle Robot Arm	04/14/80
80-024	NASA Interviews Fifth Astronaut Applicant Group	04/17/80
80-025	54-Hour Simulation	04/17/80
80-026	NASA Screens Sixth Astronaut Applicant Group	04/25/80
80-027	NASA Awards Univac Data Processing Contract	04/28/80
80-028	Visitors to Space Center Can Walk Through New Space Shuttle Cargo Bay Display	04/30/80
80-029	NASA Contracts Draper Lab for Shuttle Avionics Software	05/01/80
80-030	Shuttle Columbia's Flight Engines to Be Retested	05/01/80
80-031	NASA Signs Singer-Link Contract Add-on	05/02/80 MISSING
80-032	Space Solar Cell Contract	05/09/80
80-033	Federal Women's Program Week, May 13-16	05/09/80
80-034	Complex Sim Test RMS	05/12/80
80-035	Barrios Selected for Contract Negotiations	05/13/80

80-036	Columbia Flight Engines Retest Scheduled	05/15/80
80-037	Orbital Flight Test Program Extended	05/27/80
80-038	NASA Selects 19 Astronaut Candidates	05/29/80
80-039	Investigators File Report on Cause of Spacesuit Backpack Fire	06/10/80
80-040	Space Center Engineers Study Future Space Construction Methods	06/27/80
80-041	New Astronaut Candidates Report for Training	06/30/80
80-042	JSC names Harlan to Safety/Quality Post	06/27/80
80-043	Local High School Students Work at JSC this Summer	07/09/80
80-044	Martin Marietta to Build Space Shuttle Orbiter Tile Repair Kits	07/02/80
80-045	Two Europeans Accepted for Space Shuttle Mission Specialist Training	07/07/80
80-046	Can Plasma in the Ionosphere Be Used to Augment Space Solar Power?	07/23/80
80-047	Female Air Force Academy Grad at JSC	07/23/80
80-048	NASA Extends Northrop Aircraft Maintenance Contract	07/24/80
80-049	Astronaut Candidates Attend Water Survival School	08/07/80
80-050	New Water Tank Helps Train for Space Zero Gravity	08/20/80
80-051	Two Aerospace Firms Get Satellite Service Systems Contract	08/27/80
80-052	Shuttle Crewman to Send Live Pictures on Spacewalk	09/02/80
80-053	Engineering and Operations Support Contract Awarded	08/27/80
80-054	Lab Distills Waste Water for Reuse in Flight	09/09/80
80-055	Lighter Than the Lightest... Stronger Than the Strongest. It's Supermetal!	09/16/80
80-056	54-Hour Simulation	09/19/80
80-057	Astronaut Gibson Leaves NASA to Join TRW	10/01/80
80-058	Space Center Negotiates Fire and Safety Contract	10/01/80
80-059	54-Hour Simulation	10/17/80
80-060	Space Shuttle to Carry Space Toolbox	10/14/80
80-061	Spacesuit Life Support System Ends 14-Hour Test	10/16/80
80-062	Sun Power Kit Proposed for Shuttle	10/28/80
80-063	56-hour simulation	11/26/80
80-064	Shuttle-Era Space Suit	12/05/80
80-065	NASA Announces New Fire Resistant Material for Aircraft	12/11/80
80-066	Dr. Frosch at JSC 12/8/80	12/03/80

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Terry White

For Release

RELEASE NO: 80-001

January 10, 1980  
2 p.m. CST

## NASA EXTENDS BOEING SAFETY/QUALITY SUPPORT CONTRACT

The NASA Johnson Space Center, Houston, has extended for 18 months its cost-plus-award fee contract with The Boeing Company for safety, reliability and quality assurance engineering support. The contract extension is valued at \$11,184,430 and brings the total value of the Boeing contract to \$36,712,703.

Effective January 1, 1980, the contract extension provides for safety, reliability and quality assurance engineering and technical tasks for current and future Johnson Space Center programs for space vehicles, ground support equipment, facilities, and payloads including experiments.

###

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Kay Ebeling

For Release

RELEASE NO: 80-002

Upon Receipt

## NOTICE TO EDITORS

### SYMPOSIUM ON WOMEN IN AEROSPACE TO TAKE PLACE AT JOHNSON SPACE CENTER MARCH 12-13

Women have made notable progress building careers in the aviation and space industry. Professions that were once 100 percent male -- test-pilot, astronaut, jet-pilot, air traffic controller -- now include a growing number of women; and females are now firmly established as scientists, engineers, administrators, and technicians in aerospace.

A symposium to examine women's growing role in aerospace will take place March 12 and 13 at NASA's Johnson Space Center in Houston, Texas. Women from different vocations in aviation and space will take part in panels such as: "Are Women Accepted in the Cockpit?" and "Transition: You Can Change Careers." Female representatives from the space, military, commercial, and general aviation fields -- including astronauts, pilots, and managers -- will speak during the sessions.

- more -

The purpose of this symposium is to provide the press with information on a topic of growing interest -- one that can spin off into numerous feature and news articles. At the same time, women in aerospace from all over the country will trade ideas, compare notes, and uncover areas where progress still needs to be made.

Of special interest will be a tour of the Shuttle Mission Simulator, where female pilots will sit at the mockup cockpit of a Space Shuttle Orbiter, and a tour of Mission Control Center, where airline ground controllers can compare operations of a spaceflight with general aviation.

The symposium will use the auditoriums, audio-visual resources, and conference rooms of NASA's facility in Houston.

If a member of your news organization is considering attending the Women In Aerospace Symposium, please make tentative plans by early February, as hotel rooms are being blocked and other advance planning is necessary.

The program is being sponsored jointly by the Aviation/Space Writers Association and the American Institute of Aeronautics and Astronautics, with support from the Federal Women's Program at Johnson Space Center.

###

January 16, 1980

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Lyn Cywanowicz

For Release

RELEASE NO: 80-003

January 21, 1980

## 30-Hour Simulation

Although the first flight of the Space Shuttle Columbia is still months away, flight controllers and astronauts at the Johnson Space Center are gearing up for the long awaited mission. Mission Control Center - Houston will come alive on Wednesday, January 23 as the flight controllers and astronauts participate in a 30-hour mock flight of the mission.

The "flight" begins at 8 a.m. CST with launch and will run continuously through orbital operations to landing.

During the mock mission, flight directors and their teams of flight controllers will monitor Orbiter systems' health, perform navigation and targeting tasks, and support crew performance of the mission timeline. Each team will hand over the mission responsibility to the next team. Simulation specialists acting as "devil's advocates," will throw thorny problems at the flight controllers and Orbiter crews.

- more -

The astronauts meanwhile will be in the Shuttle Mission Simulator and in another Orbiter mockup going through their on-board checklists and performing the routine housekeeping duties of food preparation and equipment stowage.

Approximately 500 people will be involved in the "flight." This number includes astronauts John Young and Bob Crippen, the prime crew for Columbia's first flight and Joe Engle and Dick Truly, the back-up crew.

The Flight Directors for the three flight control teams will be Neil Hutchinson - Launch team, Chuck Lewis - Orbit team and Don Puddy - Deorbit/landing team.

The purpose of the simulation is to evaluate operations plans and procedures over an extended period of the mission. All previous simulations have been of relatively shorter mission time intervals such as; launch, deorbit and entry, and initial systems activation.

Additional 30-hour practice flights will be run every six weeks to two months to prepare for the real flight, scheduled for later this year.

###

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Robert Gordon

For Release

RELEASE NO: 80-004

Upon Receipt

ALSO RELEASED AT NASA HEADQUARTERS

## MARTIN RECEIVES TPS REPAIR CONTRACT

NASA has signed a letter contract with Martin Marietta Aerospace, Denver Division, for the development and production of a Space Shuttle on-orbit thermal tile repair kit,

The kit is designed for use by Shuttle crews to repair possible damage to any of the thousands of ceramic-based tiles which cover the Orbiter and protect it from intense heat during entry into the Earth's atmosphere. The kit will not be flown on the first test flight but will be held in reserve for possible use on later flights where the launch environment approaches design conditions.

The letter contract with Martin Marietta is preliminary to an official contract award and authorizes the aerospace firm to proceed with immediate design and development of the tile repair kit. Estimated value of the contract is \$2.1 million.

The contract follows studies conducted by four aerospace firms for the NASA Johnson Space Center, Houston. Proposals for the production contract were received from General Electric Company, Philadelphia, Pennsylvania, and Martin Marietta Aerospace.



The contract calls for Martin to design and fabricate three repair kits for delivery to NASA. Two of the units are for flight use and the third is for astronaut training.

The kit weighs about 300 pounds and will be stored atop the Auxiliary Equipment Storage Assembly in the Orbiter cargo bay.

There are two separate types of repair material: blocks of precured ablative material to fill in large holes and ablative paste which will be used as an adhesive for the replacement blocks as well as a cure-in-place filler to repair areas smaller than tile size.

Each kit will contain 160 replacement blocks. Each block will be approximately six-by-six inches in size with varying thicknesses of 3/4-inch to 1.5-inch. The blocks are principally made of silicone rubber which will ablate when subjected to the heat of reentry. The actual Orbiter tiles do not ablate during the heat of entry.

The cure-in-place ablator is a paste-like substance with a silicone-rubber base. It will be applied with an applicator which resembles a conventional caulking gun. Eight applicator guns are included in the repair kit.

If necessary to perform repairs, a spacesuited astronaut would don a backpack maneuvering unit in the Shuttle cargo bay, inspect the outside of the Orbiter, and if necessary, use the kit to apply the ablative materials.

###

January 22, 1980

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Terry White

For Release

RELEASE NO: 80-005

January 25, 1980  
2 p.m. CDT

## IBM AWARDED CONTRACT FOR ORBITER DATA PROCESSOR MAINTENANCE

The NASA Johnson Space Center, Houston, has awarded a cost-plus-fixed-fee contract to International Business Machines Corporation (IBM) of Houston for maintenance of data processing equipment used on the Space Shuttle Orbiter.

Covering people, equipment, materials, facilities and services, the contract is valued at about \$3,115,000.

###

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Kay Ebeling

For Release

RELEASE NO: 80-006

February 5, 1980

## BLACK HISTORY MONTH PROGRAM SET FOR JOHNSON SPACE CENTER FEBRUARY 15

"Heritage for New America" is this year's theme for Johnson Space Center's Black History program February 15, part of the 54th annual nationwide recognition of contributions black Americans have made to American life and culture.

The program begins at 2 p.m. in the Visitors' Center Auditorium (Building 2) at the Johnson Space Center February 15, and the public is invited to attend.

Judge Alexander Green, Justice of the Peace, Harris County, is this year's keynote speaker, and Mr. Ken Thomas, a Rockwell engineer at the space center will be master of ceremonies.

The Jesse H. Jones High School Glee Club will present cultural expressions through musical selections to include "Lift Every Voice and Sing."

There will be refreshments in the lobby following the program.

# # #

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**

Houston, Texas 77058  
AC 713 483-5111

---

Terry White

For Release

RELEASE NO: 80-007

February 20, 1980

## NASA BEGINS SCREENING ASTRONAUT APPLICANTS

The first 20 applicants to be interviewed for possible selection as Space Shuttle astronaut candidates will report to the NASA Johnson Space Center February 25 for a week of interviews and physical examinations. All are mission specialist applicants, of which four are women.

A total of 3122 men and women applied for the 10 to 20 open astronaut positions between October 1 and December 1, 1979. Those applicants selected for screening will spend a week at the Space Center in groups of 20.

NASA will select astronaut candidates in each of two categories--- pilot and mission specialist. Candidates will begin a year of training at JSC in July 1980, and will be selected as astronauts after satisfactory completion of the evaluation period.

The names, places of birth, high school (HS), and current duty stations or employer of the first 20 applicants selected for interviews are:

- more -

Capt. James C. Adamson, 33, U.S. Army

Warsaw, NY; HS Geneseo, NY Central

U.S. Military Academy

Capt. Anthony J. Banta, 32, USAF

Antioch, CA; HS Washington High, Fremont, CA

McClellan AFB, CA

Stuart A. Bergman, Jr., 40, MD, PhD

San Antonio, TX; HS Thomas Edison High, San Antonio

NASA Johnson Space Center

Maj. Michael W. Brennan, 36, U.S. Army

Stanley, WI; Rice Lake, WI High

Fort Sam Houston, TX

Edward F. Crawley, 25, ScD

Boston, MA; HS Belmont High, Boston

Massachusetts Institute of Technology

Carol A. Cherne, 37, MS

Washington, DC; HS Pasadena, CA High

University of Nevada, Reno

Capt. William W. Crimmel, 33, USAF

Lewiston, PA; HS Abington High, Clarks Summit, PA

NASA Johnson Space Center

Lt. Cdr. Mark S. Davis, 36, U.S. Navy

Philadelphia, PA; HS Lasalle College High, Springfield, PA

Carrier Air Wing Three, FPO New York

Anna-Maria Evanczuk, 26, PhD

Darby, PA; HS Mater Dei High, Evansville, IN  
University of Pennsylvania

William F. Fisher, 33, MD, MS

Dallas, TX; HS North Syracuse, NY High  
Physicians' Medical Group, Inc., Marina Del Rey, CA

Lt. Garland R. Johnson, Jr., 32, U.S. Navy

Aurora, IL; HS Marmion Military Academy, Aurora, IL  
Naval Military Personnel Command, Arlington, VA

James A. Korkowski, 31, MS

Urbana, IL; HS Rantoul Township, IL High  
NASA Johnson Space Center

Lt. Cdr. David C. Leestma, 30, U.S. Navy

Muskegon, MI; HS Tustin, CA High  
U.S. Navy Air Test & Evaluation Center, Point Magu, CA

Byron K. Lichtenberg, 32, ScD

Stroudsburg, PA, no HS given  
Massachusetts Institute of Technology

John M. Lounge, 33, MS

Denver, CO; Burlington, CO High  
NASA Johnson Space Center

Maj. Patrick M. Morris, 37, U.S. Army

Kansas City, MO; Neosho, MO High  
U.S. Army Aviation Engineering Flight Activity, Edwards AFB, CA

Capt. Charles A. Parlier, 31, U.S. Marine Corps

Reedley, CA; HS Hillsdale High, San Mateo, CA

Naval Air Test Center, Patuxent River, MD

B. A. Tracey Sauerland, 28, MD, PhD

Hartford, CT; HS St. Thomas Aquinas High, New Britain, CT

NASA Johnson Space Center

Capt. Rhonda L. Scott, 25, U.S. Army

Dayton, OH; HS East Aurora, NY High

Letterman Army Institute of Research, San Francisco, CA

Lt. William M. Shepard, 30, U.S. Navy

Oak Ridge, TN; HS Arcadia High, Scottsdale, AZ

Little Creek Naval Air Base, Norfolk, VA

###

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

For Release

Upon Receipt

Kay Ebeling

RELEASE NO: 80-008

"WOMEN IN AVIATION AND SPACE" SYMPOSIUM MARCH 12 & 13 TO FEATURE  
REPRESENTATIVES FROM COMMERCIAL, MILITARY, AND SPACE PROFESSIONS

(Note: Detailed program is attached)

Today women pilot high performance jet aircraft in the military. They are engineers in Mission Control Center at NASA, women are in training as astronauts, and they fly commercial jets with the major air lines. Only five years ago, these occupations were for men only--women have made remarkable progress building careers in the aerospace industry.

March 12 and 13 Johnson Space Center is hosting a symposium, "Women in Aerospace," to examine women's advancements in these professions--both to applaud the progress and to locate and discuss any remaining roadblocks.

The Aviation/Space Writers Association and the American Institute of Aeronautics and Astronautics are sponsoring the symposium, with support from the Federal Women's Program Committee at JSC.

Some of the sessions may ignite heated debate. For instance, one member of the "Are Women Accepted in the Cockpit Yet?" panel is convinced they are not--that women are physically incapable of piloting commercial aircraft. With him on that panel will be female pilots from Continental and United Air Lines.

more



Another panel, "Transition: You Can Change Careers," will feature women who broke from tradition mid-career: a former nurse who is now studying engineering; a former secretary who is now a NASA Contract Specialist; and a stewardess who is training to be a jet pilot.

The symposium opens Wednesday March 12 at 1 p.m. with a series of speakers and presentations in the Visitor Center Auditorium on the LBJ Space Center site. Thon Griffith, International President of the Ninety-Nines, Inc., will give the keynote address. (The Ninety-Nines is a professional organization for women pilots founded in 1929 by Amelia Earheart.)

Among the women speaking will be a T-37 instructor who is an Air Force Captain, the Deputy for Personnel Development in the Astronaut Office at NASA, a Director of Consumer Affairs with United Air Lines, a scientist astronaut, and the president of an aviation firm in Houston.

The two panels will take place Thursday the 13th in the Gilruth Center on site from 9 a.m. to noon.

NOTE TO EDITORS:

A block of hotel rooms has been set aside in a hotel near the Space Center. For further information on these rooms, or to register in advance for the Thursday lunch (see attached) contact Kay Ebeling at 713/483-5111, or Don Cannalite at 303/398-4535.

February 25, 1980

WOMEN IN AVIATION AND SPACE SYMPOSIUMDATES: March 12 and 13, 1980LOCATION: NASA-Johnson Space Center  
Houston, Texas 77058SPONSORS: American Institute of Aeronautics and Astronautics  
Aviation/Space Writers AssociationSCHEDULE:

Wednesday, March 12

0900-1300	Registration		Bldg. 2 Lobby
	Continuous showing of films on the Space Program		Bldg. 2 Auditorium
1300-1305	Welcome	Clifford Charlesworth Deputy Director, NASA-JSC	"
1305-1400	Keynote Address	Thon Griffith International President Ninety-Nines, Inc.	"
1400-1425	Women in Commercial Aviation	Kay Lund Director of Consumer Affairs United Airlines	"
1425-1445	Break - Coffee Served		Bldg. 2 Lobby
1445-1510	Women in General Aviation	Mary Able M. Able Aviation Company, Inc. & FAA Designated Flight Examiner	Bldg. 2 Auditorium
1510-1535	Flying Opportunities for Women in the Military	Captain Stephanie Wells T-37 Instructor, USAF	"
1535-1600	Women in Space	Dr. Carolyn Huntoon Deputy for Personnel Development, Astronaut Office, Chief, Biomedical Laboratories Branch, NASA	"
1615-1800	Tour of Shuttle Mission Simulator	Dr. Judith A. Resnik Astronaut, NASA	Bldg. 5
	Tour of Mission Control Center	Eugene F. Kranz Deputy Director Flight Operations, NASA	Bldg. 30

Thursday, March 13

0900-1015 Are Women Accepted in the Cockpit Yet? Bldg. 2 Auditorium

Moderator: Captain J. D. Smith  
Trudy Cooper Vice President  
Vice President Flight Safety & Industry Affairs  
Global Air Enterprises United Airlines

Captain Emily Howell Warner  
Pilot, Frontier Airlines

First Officer Claudia Jones  
Co-Pilot, Continental Airlines

Steven S. Myers  
Manager, Program Development  
Bell Aerospace Systems Division

1015-1030 Break - Coffee Bldg. 2 Lobby

1030-1200 Transition: You Can Change Careers Bldg. 2 Auditorium

Moderator: Marilyn Bockting- Director  
Career Resources

Patti Mancini-Vice President  
External Affairs &  
Communications  
Rockwell International

Ann Sullivan, Contract Specialist  
Procurement Branch  
NASA

Linda McOmber  
Nurse, Engineering Student

Stephanie Coleman  
Flight Attendant & Student Pilot  
United Air Lines

1200-1230 Break

1230-1400 Luncheon (Advance Reservations required) Gilruth Center  
Life in the Astronaut Dr. Kathryn D. Sullivan  
Business Astronaut, NASA

The Next Step Sue Butler  
Director of Communications  
United Technologies

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Lyn Cywanowicz

For Release

RELEASE NO: 80-009

February 27, 1980

## NASA SYMPOSIUM '80 TO BE HELD AT KELLY AIR FORCE BASE

NASA's Aerospace Symposium '80 will be held March 12-14 at Kelly Air Force Base, San Antonio, Texas.

The symposium is designed to motivate students--especially females and minorities--to seek careers in science and engineering.

More than 220 students, teachers and counselors will participate in the three days of seminars and workshops. A tour of Kelly Air Force Base is also planned.

Seminars will be conducted by NASA scientists and engineers. Topics of the seminars include: Exploring the Outer Planets; Astronomy; Benefits from Space Medicine; Space Shuttle Program; Solar Power; and Future Space Systems.

NASA astronauts Frederick D. Gregory, Terry J. Hart and Judith A. Resnik will present awards to students who submitted outstanding science papers prior to the symposium. The papers are being judged by Johnson Space Center scientists and engineers.

Symposium activities will take place in Hangar 1610 from 9:30 a.m. to 2:45 p.m. each day.

###

Note to Editors

For additional information contact A. D. McCall at (512) 925-7951 in San Antonio, Texas.

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Terry White

For Release

Immediate

RELEASE NO: 80-010

## LUNAR AND PLANETARY CONFERENCE WILL BE MARCH 17-21 IN HOUSTON

More than 700 scientists from all parts of the world are expected to attend the 11th annual Lunar and Planetary Science Conference next month at NASA's Johnson Space Center in Houston.

The weeklong conference, beginning Monday, March 17, is being hosted jointly by the Johnson center and the Lunar and Planetary Institute of Houston.

Focusing on the Year of the Planets, the conference will center around recent results from a variety of planetary encounters in 1978-79, as well as new information on the Moon, Mars and meteorites.

The sessions will include:

- \* Reports on recent results from the moons of Jupiter obtained by Voyager spacecraft.

- \* New data on Venus from the Pioneer Venus spacecraft.

- \* Recent analysis of Viking orbiter and lander data still being sent back from Mars.

- \* Details of the analysis of meteorites recently collected in large numbers from Antarctica.

New theoretical, experimental and analytical studies of the Moon, based on lunar sample analyses and on continued Apollo data analysis, will be the topics of several conference sessions. Detailed models of the Moon's interior structure and composition are being developed for comparison to Earth and other planets.

Two groups of lunar samples are being given special attention at this year's conference: complex fragmental rock (breccias) from the light-colored lunar highlands are being examined to understand the early history of the Moon and the Earth. Long cores of "lunar soil," the powdery rubble that covers the mare's surface, are being carefully dissected to trace the history of the Sun -- a history written by tiny atomic particles from the Sun that have been trapped in the lunar soil for millions of years.

One evening will be devoted to lectures of general interest. Topics will include Mars, Venus, Jupiter's moons, Antarctic meteorites and the United Nations treaty dealing with utilizing the Moon and planets. Results of applying satellite remote-sensing techniques to geological studies of the Earth will be another evening's special session.

"Poster sessions" in which authors of papers will use graphic displays to discuss their work informally during breaks in the schedule will be featured for the first time. The posters will be displayed in the Recreation Center gymnasium.

The conferences begun in 1970, were originally used to share the knowledge gained from the lunar samples returned by the Apollo missions.

The first six Lunar Science Conferences were almost entirely devoted to lunar studies. More recently, lunar research has become increasingly important for helping to understand the other planets of the solar system, and the last three conferences included much more information about comparative studies of such other bodies as Mercury, Venus, Mars and the asteroids. The name of the conference has been changed to "Lunar and Planetary" to reflect the continuing trend for combined studies in planetary exploration.

Concurrent sessions will be held in the Johnson Center's main auditorium and in two halls at the Gilruth Recreation Center. Conference cochairmen are Dr. Michael Duke, Chief of Johnson's Planetary and Earth Sciences Division, and Dr. Roger J. Phillips, director of the Lunar and Planetary Institute.

- end -

#### NOTE TO EDITORS

Reporters and science editors planning to cover the Conference should register at the Gilruth Recreation Center prior to the opening session at 9 a.m. March 17. Out-of-town newsmen are urged to make reservations for JSC-area motels as soon as possible. For further information, call the JSC Public Information Office, 713-483-5111.

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Kay Ebeling

RELEASE NO: 80-011

For Release

March 3, 1980

## NASA DEVELOPS SYSTEM FOR HEAT TREATMENT OF CANCER

Cancer research has shown that heat treatments can destroy cancer cells without harm to adjacent healthy tissue. Methods for producing heat have grown steadily in sophistication--starting in 1893 when doctors induced fever in cancer patients to today's techniques such as ultrasound, radiated microwave, and blood perfusion.

In mid-1978 the NASA Johnson Space Center signed a memorandum of understanding with the Stehlin Foundation for Cancer Research at St. Joseph's Hospital in Houston, saying the space center will provide technical support for the foundation's work with heat, or hyperthermia, treatment of cancer.

Tumors will heat faster than healthy tissue perhaps because they hold more fluid to contain the heat, and fewer blood cells to carry the heat away. Tumors have restricted blood flow. Heat concentrated on a cancerous area can destroy cancer cells without harming healthy tissue nearby.

The challenge for JSC engineers was to improve radio frequency (RF) heating techniques being used at the Stehlin Foundation. First step was to develop a machine for treatment of small animals.



Then after a year of tests on mice, JSC scientists developed an advanced RF hyperthermia system for treatment of humans.

"The human RF system has performed successfully on several cancer patients," said Kumar Krishen of JSC's Experiment Systems Division. Krishen is technical coordinator of the project. "Developing the advanced human RF hyperthermia system involved acute concerns about safe and reliable performance."

For work on the machine to be used on humans, Krishen's team called for assistance from JSC's safety and reliability specialists who reviewed the overall design and performance of the equipment.

In January 1980 the team delivered an experimental human treatment system to St. Joseph's hospital.

"The RF system for human treatment uses a gradual buildup of power to its preselected value," Krishen said. "Two pairs of sequentially driven electrodes provide more concentration of RF power at the tumor and disperse heat at the skin."

The team also developed a feedback control which allows regulation of temperatures within a specific area to an accuracy of 0.2<sup>0</sup> C.

One area of concern was heating of the skin below the electrodes which in some cases causes burns. "Our approach was to circulate temperature-controlled water through metal tubing soldered onto the back of flexible electrodes," Krishen said. "This scheme has been found to be very useful."

A data printer added to the system records temperatures and power levels as a function of time.

"The small animal experimental system we first designed yielded very valuable data," Dr. Krishen said. After trying different combinations, the ESD team came up with an optimum size and shape for the applicator. They determined the maximum heat the animal's body could tolerate, 41<sup>0</sup>C, and gave the applicator a convex shape to keep "hot spots" from coming into contact with the skin.

"A notable feature of the small animal system is the ability to apply up to 50 watts at five frequencies from three MHz to 30," Dr. Krishen said. "This helps us to indicate the advantages, if there are any, of treating various cancer types at a specific frequency."

The small animal system is used currently to establish human protocols and to study the effects of hyperthermia at the cell level.

"The challenge now is to deliver the heat with minimized side effects," Dr. Krishen said. "We are investigating the possibility of transmitting the radio waves through the patient with electrodes that do not come in contact with the skin. They will function somewhat like antennae."

This assignment was a particular challenge for Krishen and his co-workers, since their specialty is observing the Earth's weather, soil conditions, and agriculture using microwave data from aircraft and satellites.

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

For Release

Terry White

February 29, 1980

RELEASE NO: 80-012

## NASA SIGNS MARTIN MARIETTA TO BUILD MANNED MANEUVERING UNIT

The NASA Johnson Space Center in Houston has signed a cost-plus-award fee contract with Martin Marietta Corporation of Denver, Colorado for a production of the manned maneuvering unit. The contract is valued at \$26,701,575, and follows an earlier letter contract.

Two flight units, trainers, spares, ground support equipment and special tools are covered under the contract. The manned maneuvering unit is powered by gaseous nitrogen thrusters.

Scheduled to first fly on the second Space Shuttle orbital flight, the manned maneuvering unit provides free-flying mobility to Orbiter crews for inspection and repair of the spacecraft's glass-tile heatshield. Additionally, the backpack maneuvering unit would improve crew spacewalk capability during rescue or contingency operations.

###

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

For Release

Terry White

March 4, 1980

RELEASE NO: 80-013

## NASA INTERVIEWS SECOND GROUP OF ASTRONAUT APPLICANTS

The second group of 20 astronaut applicants will report to the NASA Johnson Space Center March 10 for a week of physical exams and interviews.

All in the second group are mission specialist applicants from among the 3122 men and women who applied last fall. There are five women in this second group.

Applicants selected from those screened in groups of 20 will begin a year's training as astronaut candidates in July 1980.

Names, birthplaces, high school, and current employer or duty station of the second 20 applicants selected for interviews are:

James P. Bagian, 28, MD

Philadelphia, PA; Philadelphia Central High  
University of Pennsylvania Hospital

Mary L. Cleave, 33, PhD

Southampton, NY; Great Neck North Senior High  
Utah Water Research Laboratory, Logan UT

- more -

Maj. Douglas L. Dowd, 36, PhD

Miami, FL; Midland High School

USArmy, APO San Francisco

Warren L. Eastman, 35, MS

Oak Park, IL; Clover Park High

The Boeing Company, Seattle, WA

Paul V. Edelen, 37, MD

New York, NY; no high school given

University of Connecticut Health Center, Farmington, CT

Lucy E. Edwards, 28, PhD

Richmond, VA; Highland Springs High

U.S. Geological Survey, Reston, VA

Capt. Frank B. Gray, Jr., 32, USAF, MS

Glendale, OH; Mr. Healthy High

USAF, Eglin AFB, FL

Capt. Andrew J. Green, 30, US Army, PhD

Utica, NY; Waterville Central High

U.S. Army (Armor)

Cdr. Clarence J. Hatleberg, 36, US Navy, PhD

Minneapolis, MN; Chippewa High

U.S. Navy Underwater Demolition Team 11

Marsha S. Ivins, 28, BS

Baltimore, MD; Nether Providence High

NASA Johnson Space Center

Robert M. Kieckhefer, 27, PhD

Evanston, IL; The Loomis School

Scripps Institution of Oceanography, La Jolla, CA

Capt. Bohdan G. Kunciw, 32, USAF, PhD

London, England; Cardinal Dougherty

USAF, McClellan AFB, CA

Lcdr. James M. McDonald, 34, US Navy, PhD

Trenton, NJ; Archbishop John Carroll High

U. S. Navy, FPO New York

Maj. Richard C. Oliver, 36, USAF, PhD

Sacramento, CA; Amador County High

USAF Academy, Colorado Springs, CO

Maj. Edson O. Parker, III, 32, US Army, MD

Upland, CA; Chaffey High, Ontario, CA

Letterman Army Medical Center, San Francisco

Mary L. Phillips, 28, PhD

Corvallis, OR; Boulder High

City of Hope National Medical Center, Duarte, CA

Maj. John H. Pletcher, 34, USAF, PhD

Findlay, OH; St. Francis de Sales High

USAF Academy, Colorado Springs, CO

Capt. Jerry L. Ross, 32, USAF, MS

Gary, IN; Crown Point High

USAF, at NASA Johnson Space Center

Cynthia A. Shelby-Lane, 29, BS

Highland Park, MI; Pershing High

University Emergency Physicians, Detroit, MI

Maj. Sherwood C. Spring, 35, US Army, MS

Hartford, CT; Pogansett High

US Army, APO San Francisco

NASA-JSC

# # #

ERRATA for JSC News Release No. 80-013 NASA INTERVIEWS 2ND GROUP

Page 3: Substitute for Edson O. Parker III the following name

Creighton H. Tom, 35, PhD  
Oakland, California; Oakland Senior High  
Science Applications, Inc., Golden, CO

ERRATA for JSC News Release No. 80-013 NASA INTERVIEWS 2ND GROUP

Page 3: Substitute for Edson O. Parker III the following name:

Creighton H. Tom, 35, PhD  
Oakland, California; Oakland Senior High  
Science Applications, Inc., Golden, CO

ERRATA for JSC News Release No. 80-013 NASA INTERVIEWS 2ND GROUP

Page 3: Substitute for Edson O. Parker III the following name:

Creighton H. Tom, 35, PhD  
Oakland, California; Oakland Senior High  
Science Applications, Inc., Golden, CO

ERRATA for JSC News Release No. 80-013 NASA INTERVIEWS 2ND GROUP

Page 3: Substitute for Edson O. Parker III the following name:

Creighton H. Tom, 35, PhD  
Oakland, California; Oakland Senior High  
Science Applications, Inc., Golden, CO

ERRATA for JSC News Release No. 80-013 NASA INTERVIEWS 2ND GROUP

Page 3: Substitute for Edson O. Parker III the following name:

Creighton H. Tom, 35, PhD  
Oakland, California; Oakland Senior High  
Science Applications, Inc., Golden, CO

ERRATA for JSC News Release No. 80-013 NASA INTERVIEWS 2ND GROUP

Page 3: Substitute for Edson O. Parker III the following name:

Creighton H. Tom, 35, PhD  
Oakland, California; Oakland Senior High  
Science Applications, Inc., Golden, CO

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

For Release  
March 5, 1980

Terry White

RELEASE NO: 80-014

## NASA EXTENDS LOCKHEED WHITE SANDS CONTRACT

The NASA Johnson Space Center's White Sands Test Facility, Las Cruces, NM has extended for a year its contract with Lockheed Engineering and Management Services Company, Inc. covering support services and maintenance of test stands and laboratories.

The cost-plus-award-fee contract is valued at \$12 million and began February 1, 1980.

# # #



# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

For Release

Kay Ebeling

Upon Receipt

RELEASE NO: 80-015

PORTRAIT OF GODDARD UNVEILING MARCH 17 AT SPACE CENTER

MARKS 54TH ANNIVERSARY OF ROCKET TECHNOLOGY BREAKTHROUGH

A portrait of Dr. Robert H. Goddard, liquid-fuel rocket pioneer, will be unveiled March 17 at 3 p.m. in the Visitor Center at Johnson Space Center.

The portrait, on loan to JSC from Aviation Week & Space Technology Magazine's collection, was painted by Soss Efrem Melik.

Goddard fired the first successful liquid-fuel rocket on March 19, 1926, in Auburn, Massachusetts, creating the technology that later enabled man to go to the Moon.

On hand for the unveiling will be James R. Pierce, Aviation Week publisher, and JSC Director Christopher C. Kraft, Jr.

March 10, 1980

# # #

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Kay Ebeling

For Release

RELEASE NO: 80-016

March 20, 1980

## LABORATORY AT JOHNSON SPACE CENTER

### TESTS AND RE-TESTS SHUTTLE AVIONICS SYSTEM

It is two minutes into a Space Shuttle flight. Onboard computers activate pyrotechnic devices and the solid rocket boosters separate from the Orbiter. They descend to altitudes where a drogue chute and a parachute control their descent into the ocean.

However, almost immediately after separation, the crew observes that the Space Shuttle main engine three status light is RED. There is a problem. The crew also observes the main propulsion system pressure for engine three is rapidly decreasing to 0 percent. With an engine failure at this time, the Orbiter cannot achieve orbital velocity.

The crew selects the return-to-launch-site abort mode, and the Orbiter returns to Kennedy Space Center.

The mission described above actually took place at Johnson Space Center in the Shuttle Avionics Integration Lab. It was one of a series of tests that will be run before launch of the Space Shuttle later this year. Persons operating the equipment know it was just a simulation,

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Terry White

For Release

RELEASE NO: 80-017

March 20, 1980

## NASA SCREENS THIRD ASTRONAUT APPLICANT GROUP

The third group of 20 astronaut applicants will begin physical exams and interviews March 24 at the NASA Johnson Space Center.

There are nine pilot astronaut applicants and 11 mission specialists in this group. Five are women.

Applicants selected from those screened in groups of 20 will start a year's training as astronaut candidates in July 1980. Applications were received from 3122 men and women in the fall of 1979.

Names, colleges, birthplaces, high school, and current employer or duty station of the third 20 applicants selected for screening are:

- more -

Pilots:

Maj. Charles F. Bolden, Jr., 33, USMC; MS University of Southern California  
Columbia, SC; C.A. Johnson High  
Marine Aviation Detachment, NAS Patuxent River, MD

Lieut. Kenneth D. Cockrell, 29, US Navy; MS University of West Florida  
Austin, TX; Rockdale High  
Naval Air Test Center, NAS Patuxent River, MD

Maj. Donald A. Cornell, 35, US Air Force; BA Albion College  
Detroit, MI; Cleveland Heights High  
Eglin Air Force Base, FL

Lieut. Robert M. Norman, 27, US Navy; BS US Naval Academy  
Jacksonville, FL; T.C. Williams High  
Naval Air Test Center, NAS Patuxent River, MD

Lieut. Stephen S. Oswald, 28, US Navy; BS US Naval Academy  
Seattle, WA; Bellingham, WA High  
Naval Air Test Center, NAS Patuxent River, MD

Paul S. Skabo, 37; MS University of New Mexico  
Dixon, IL; Minot High  
NASA Johnson Space Center

Capt. Charles W. Staley, 34, US Air Force; MS Princeton University  
Bryn Mawr, PA; Plymouth Whitemarsh High  
Edwards Air Force Base, CA

- more -

Charles F. Stender, 39; BS Pennsylvania State University  
East Orange, NJ;  
Trans World Airlines, Los Angeles, CA

Maj. Allan G. Thaut, 34; USMC;MS University of West Florida  
Billings, MT; Wilsall High  
NAS Patuxent River, MD

Mission Specialist Applicants:

Franklin Ramon Chang, 29; PhD Massachusetts Institute of Technology  
San Jose, Costa Rica; Hartford High  
The Charles Stark Draper Laboratory, Inc., Cambridge, MA

Mark J. Cintalla, 27; PhD Brown University  
Wilkes-Barre, PA; Greater Nanticoke Area High  
Brown University, Providence, RI

Peter W. Cole, 33; MA Boston University  
Seattle, WA; Mount Vernon High  
Boston University

Peter A. Curreri, 27; PhD University of Florida  
Brooklyn, NY; Brooklyn Technical High  
University of Florida, Gainesville, FL

Bonnie J. Dunbar, 31; MS University of Washington  
Sunnyside, WA; Sunnyside High  
NASA Johnson Space Center

Linda M. Godwin, 27; MS University of Missouri  
Cape Girardeau, MO; Jackson High  
University of Missouri, Columbia, MO

Marianne E. Hamm, 33; PhD Texas A&M University

Fall River, MA; Annapolis High

Los Alamos Scientific Laboratory, Los Alamos, NM

Mary H. Johnston, 34; PhD University of Florida

West Palm Beach, FL; Dan McCarty High

NASA Marshall Space Flight Center, Huntsville, AL

Carolyn M. Kramer, 27; MS University of California - Berkeley

Chicago, IL; H.L. Richards High

Sandia Laboratories, Livermore, CA

Miles R. Palmer, 26; BS Massachusetts Institute of Technology

Roby, TX; Green Forest High

University of California, La Jolla, CA

Larry D. Petro, 31; PhD University of Michigan

Lansing, MI; Niles, MI High

Center for Space Research, MIT, Cambridge, MA

###

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Robert Gordon

For Release

Release no: 80-018

March 21, 1980

## BOEING AWARDED SOC CONTRACT

NASA Johnson Space Center has selected the Boeing Aerospace Company, Seattle, Washington, for award of a contract for a system analysis study of a Space Operations Center which would operate in low Earth orbit.

The 12-month study calls for Boeing to perform a system analysis of the operations center concept, including engineering analysis of the operational facilities and systems needed for construction of large space systems and flight support of manned and unmanned orbit transfer vehicles.

The Space Operations Center would provide a space based facility with the capability for construction and checkout of large orbiting systems in space, on-orbit assembly, launch and recovery and servicing of space vehicles satellite servicing, and eventually provide permanent manned operations capability in space with reduced dependence on Earth for control and resupply.

The Space Shuttle would be the prime vehicle for launch and implementation of the operations center.

The study contract will conclude with a final report 12-months after the start of the initial studies. NASA expects this contract to cost approximately \$400,000.

###

NASA-JSC

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Terry White

For Release

RELEASE NO: 80-019

April 2, 1980

## SPACE CENTER SCREENS FOURTH GROUP OF ASTRONAUT APPLICANTS

Astronaut applicant group four April 7 will begin a week of interviews and physical exams at the NASA Johnson Space Center.

The group has 11 pilot astronaut applicants and nine mission specialist applicants, of whom three are women. Groups of 20 applicants are screened every other week from among 3122 men and women who applied in the fall of 1979. Those selected will begin a year's training as astronaut candidates in July 1980.

Names, colleges, birthplaces, highschool, and current employer or duty station of applicants in group four are:

- more -



Pilots:

Lcdr. James O. Ellis, Jr., 32, U.S. Navy; MS University of West Florida

Spartanburg, SC; Marietta High

NAS Miramar, San Diego, CA

Maj. Guy S. Gardner, 32, USAF; MS Purdue University

Altavista, VA; George Washington High

Clark AFB, The Philippines

Maj. Ronald J. Grabe, 34, USAF; MS W.Ger. Technische Hochschule

New York, NY; Stuyvesant High

USAF Test Pilot School, Edwards AFB, CA

Stephen J. Monagan, 35; MS University of Florida

Waterbury, CT; Crosby High

Calspan Advanced Technology Center, Buffalo, NY

Maj. Bryan D. O'Connor, 33, US Marine Corps; MS University of West Florida

Orange, CA; Twenty-Nine Palms High

Naval Air Systems Command, Washington, DC

Peter T. Reynolds, 35; MS University of Colorado

Panama; Maple Heights High

Gates Learjet Corp., Wichita, KS

Maj. Wayne E. Rhynard, Jr., 35, USAF; MS Air Force Institute of Technology

Langley AFB, VA; East High

Edwards AFB, CA

Lcdr. Richard N. Richards, 33, US Navy; MS University of West Florida

Key West, FL; Riverview Gardens High

Naval Air Test Center, Patuxent River, MD

Maj. Vernon P. Saxon, Jr., 34, USAF; MS Air Force Institute of Technology  
Birmingham, AL; Bellevue High  
Edwards AFB, CA

Lcdr. Michael J. Smith, 34, US Navy; MS U.S. Naval Postgraduate School  
Morehead, NC; Beaufort High  
Attack Sqdn 75, FPO New York

Maj. Patrick Sullivan, 32, US Marine Corps; MS University of Maryland  
Manila, Philippine Islands; Walton High  
MCAS, Cherry Point, NC

Mission Specialists:

Charles A. Beichman, 28; PhD University of Hawaii  
New York, NY; Trinity School  
California Institute of Technology, Pasadena, CA

Lcdr. Ralph E. Chatham, 31, US Navy; PhD State University of NY at Stony Brook  
Cleveland, OH; Chagrin Falls High  
USS George C. Marshall, FPO New York

Josephine B. Cimino, 26; MS California Institute of Technology  
Lorain, OH; Ygnacio Valley High  
California Institute of Technology, Pasadena, CA

Alicia B. Ehrhardt, 30; PhD University of Wisconsin  
Glendale, CA; Preparatoria Insurgentes, Mexico  
Johns Hopkins University Applied Physics Lab, Laurel, MD

John J. Friel, 35; PhD University of Pennsylvania

Riverside, CA; LaSalle College High

Bethlehem Steel Corp., Bethlehem, PA

Sylvester J. Gates, Jr., 29; PhD Massachusetts Institute of Technology

Tampa, FL; L.C. Jones High

Harvard University, Cambridge, MA

Philip M. Lubin, 26; AB University of California-Berkeley

Los Angeles, CA; (no high school given)

Lawrence Berkeley Lab, Berkeley, CA

Edson O. Parker, 32; MD Vanderbilt University School of Medicine

Upland, CA; Chaffey High

Letterman Army Medical Center, San Francisco, CA

Lieut. M. Susan Wilkerson, 26, USAF; PhD University of Arizona

San Diego, CA; Will C. Crawford High

Lackland AFB, Texas

###

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Kay Ebeling

For Release

RELEASE NO: 80-020

Upon Receipt

## GOSSAMER ALBATROSS CRAFT TO BE ON DISPLAY

AT JOHNSON SPACE CENTER APRIL 3 - 28

A craft that represents a unique side of aerodynamics is on display at the LBJ Space Center through April 28.

The Gossamer Albatross, the man-powered aircraft that crossed the English Channel last June, will hang from the high-bay ceiling of Building 9A at the space center for the Houston stop of the aircraft's nationwide tour.

Building 9A will be open daily from 9 - 4 for the month, and a film, "The Gossamer Albatross," will be shown at intervals with an Apollo 17 flight film in the Visitor Center auditorium.

The exhibit opened with the hoisting of the Albatross April 3 at 1 p.m., with remarks by Christopher Kraft, center director, and Bryan Allen, the cyclist-pilot of the aircraft.

Building 9A houses Space Shuttle Orbiter mockups that are used for astronaut training. The full-scale mockups in the area with the Albatross will be a unique sight for visitors to JSC in April.

- more -

The 70-pound Albatross has a wingspan of 96 feet (more than a DC-9). Its fish-shaped fuselage is made of clear fibers and films. The craft can fly 10 m.p.h. under optimum conditions (less than 4 knot winds) at 10-15 feet above the ground.

NASA has just completed a month of tests with the Albatross' sister ship at Dryden Flight Research Center at Edwards, California. NASA's Langley Research Center in Hampton, Virginia, manages the project.

NASA is studying the craft's unique aerodynamic traits, conducting research on the Albatross' low speed flight at low Reynolds numbers. Attitude, speed, mass, and turbulence are important factors in the tests, as is the craft's apparent mass effect, the displacement of air it causes in flight.

At Dryden, the craft flew test flights with different power sources -- motor power, cycle power, and towing. Goal of the study is to learn more about the craft's maneuverability and to define and predict its performance under varying conditions.

Tests ended April 1 and a report is due out in early 1981.

Bryan Allen pedalled the craft on display at JSC across the English Channel in June 1979, winning designer Dr. Paul MacCready the Kremer Cross-Channel Competition. MacCready will be in Houston April 15 and 16 with the exhibit.

###

April 1, 1980

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Terry White

For Release

RELEASE NO: 80-021

April 11, 1980

## FIRST SHUTTLE CREW TRAINS FOR PARACHUTE WATER LANDINGS

Prime and backup flight crews for the first Space Shuttle orbital flight will undergo emergency water landing training Wednesday at the USAF Water Survival School, Homestead AFB, Florida.

John W. Young and Robert L. Crippen, prime crew for the first orbital flight, and backups Joe H. Engle and Richard H. Truly will attend an abbreviated version of the Air Force class on survival in water landings after ejection from disabled aircraft. Shuttle Orbiter Columbia is fitted with crew ejection seats for the first four orbital flights. The ejection seats will be replaced with Orbiter crew couches when the Shuttle system becomes operational.

After liftoff and until reaching an altitude of 80,000 feet, Orbiter crews in an emergency can eject from the spacecraft. Crewmen would descend on personal parachutes to the Atlantic Ocean and board one-man liferafts attached to their parachute harnesses.

The Water Survival School course includes towing students in a parasail behind a boat, releasing the towline at 500 feet altitude, descending to a water landing, and inflating and boarding the rafts. The four Shuttle astronauts will wear Air Force high-altitude pressure suits which are similar to the suits to be worn in the first four orbital flights.

Columbia's first orbital flight, with Young and Crippen as crew, is planned for late 1980 or early 1981.

###

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Kay Ebeling

For Release

Release No: 80-22

Upon Receipt

Also Released At NASA Headquarters

## NASA SATELLITE TO AID TIMBER INDUSTRY IN MANAGING FOREST LANDS

An Earth resources NASA satellite has found a new use: gathering data to improve management of America's forest lands.

The project reflects a unique relationship between the government agency and the private sector; one in which the initiating company is sharing the total cost but the technology developed will be available to all other timber companies.

The satellite is Landsat-3. The company is the St. Regis Paper Co., New York.

Since 1977, St. Regis has been working with NASA in a test program to see if Landsat data could improve the paper industry's information base on forest lands. St. Regis wants to use the data for planning timber harvests, leasing and buying new timber lands, and to monitor more than 920,000

more

hectares (2.3 million acres) across the South.

The project has been so successful that the St. Regis Southern Timberland Div., Jacksonville, Fla., recently authorized over \$300,000 of new capital investment for a forest resource information system to use Landsat data to supplement conventionally acquired data in its general operations.

The entire forestry industry stands to gain from the venture because technology developed by the St. Regis experiment is in the public domain and available to other companies. The company and NASA plan to conduct a symposium in 1981 to demonstrate Landsat interpretation methods to timber industry managers.

St. Regis was the first private company to act as a user in NASA's Resource Observation Applications Test Program. The project established a unique relationship between NASA and the private sector for St. Regis initiated the project--rather than NASA--and the company is sharing in the total cost.

St. Regis will use techniques developed in the project at its Dallas computer facility to process the data coming from Landsat which will complement the automated data base at the St. Regis divisional remote sensing center in Jacksonville. This combined data will assist the company in estimating timber volume and productivity, as well as changes in the



conditions of the forests.

Landsat data will be used to determine distribution of the major types of trees on St. Regis-owned timberland in Texas, Florida, Georgia, Alabama, Mississippi, and Louisiana and other land available through lease or purchase.

The project is being conducted by NASA's Johnson Space Center, Houston; the Laboratory for Applications of Remote Sensing at Purdue University in Lafayette, Ind.; and the St. Regis Paper Co. It is scheduled to end in September of this year.

Landsat-3 orbits the globe 14 times a day at an altitude of 900 kilometers (560 miles). Its electronic multispectral scanner returns data which is processed into film and computer tape format. This resource information may be used to characterize different types of terrain, vegetation, soils, rocks, and other surface features.

###

Note to Editors:

Quarterly reports on the Applications Pilot Test Program are available for review at the NASA Scientific and Technical Information Facility, P.O. Box 8767, Baltimore/Washington International Airport, Md. 21240  
Phone: 202/621-1910

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Terry White

For Release

Release No: 80-023

April 14, 1980

## NASA SIGNS CANADIANS TO BUILD SHUTTLE ROBOT ARM

The NASA Johnson Space Center has signed a contract with Canadian Commercial Corporation of Hull, Quebec, covering production of three remote manipulator systems for the Space Shuttle Orbiter.

Valued at \$63,640,000, the cost-plus-fixed-fee contract will be 100 percent subcontracted to Spar Aerospace Ltd. of Toronto, Ontario. The contract formalizes a letter contract issued May 1, 1979.

The remote manipulator system is a 50-foot long jointed arm operable from within the crew compartment to deploy or retrieve payloads in space.

A 1975 memorandum of understanding between NASA and the Canadian National Research Council provided that Canada would build the first manipulator flight unit at no cost to NASA. Additional flight units would be bought from Canada under the agreement.

###

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Terry White

For Release

RELEASE NO: 80-024

April 17, 1980

## NASA INTERVIEWS ASTRONAUT APPLICANT GROUP FIVE

The fifth group of astronaut applicants will begin a week of interviews and physical exams April 21 at the NASA Johnson Space Center.

Group five has 13 pilot astronaut applicants and seven mission specialist applicants, of whom two are women. Applicants are screened in groups of 20 every other week from among the 3122 men and women who applied in the fall of 1979. Astronaut candidates selected will begin a year's training in July 1980.

Names, colleges, birthplaces, high school, and current employer or duty station of applicants in group five are:

- more -

Pilots:

Maj. Stewart E. Cranston, 35, USAF; MBA Auburn University

Watertown, SD; Cocoa High School

Hq USAF, DCS/RD&A, Washington, DC

Lcdr. Christopher Benjes, 32, U.S. Navy; MS US Naval Postgraduate School

Annapolis, MD; William Tennent High

NAS Patuxent River, MD

LtCol. John E. Blaha, 37, US Air Force; MS Purdue University

San Antonio, TX; Granby High

Hq USAF, Washington, D.C.

LtCol. Roy D. Bridges, Jr., 36, USAF; MS Purdue University

Atlanta, GA; Gainesville High

Hq USAF, Washington, D.C.

Lcdr. William M. Cima, 33, US Navy; MS US Naval Postgraduate School

Port Townsend, WA; Gateway High

Fighter Sqdn 114, San Diego, CA

Lcdr. Keith E. Crawford, 33, US Navy; MS Ohio State University

Massillon, OH; Northwest High

NAS Patuxent River, MD

Capt. James C. Dunn, 32, USAF; MS Carnegie-Mellon University

New Brunswick, NJ; Franklin High

Eglin AFB, FL

Lcdr. John A. Fergione, 31, US Navy; MS University of West Florida

New London, CT; St. Bernard's High

NAS Patuxent River, MD

Capt. George J. Hoerter, 33, USAF; MS University of California at LA  
Newport News, VA; Culver Military Academy  
Kirtland AFB, NM

Lcdr. David E. Lovelady, 36, US Navy; BS US Naval Academy  
Florence, AL; Ramsay High-Birmingham, AL  
Pacific Missile Test Center, Point Mugu, CA

LtCol. Timothy F. O'Keefe, Jr., 37, USAF; MA University of Northern Colorado  
Cuero, TX; St. John's College, Washington, DC  
Langley AFB, VA

Kurt C. Schroeder, 41; BS University of Wisconsin  
Milwaukee, WI; Wahwatosia High  
Grumman Aerospace Corp., Point Mugu, CA

Maj. Robert C. Springer, 37; US Marine Corps; MS US Naval Postgraduate School  
St. Louis, MO; Ashland, OH high  
Norfolk, VA

Mission Specialists:

Rebecca L. Dodge, 27; MS Colorado School of Mines  
Dallas, Texas; Arlington, TX High  
US Geological Survey, Golden, CO

Ricardo Gutierrez-Lee, Jr., 28; MA University of California-Irvine  
Havana, Cuba; Santiago High  
University of California, Irvine, CA

Lcdr. Kenneth R. Koskella, 32, US Navy; MD Washington University Medical School  
Council, ID; Ben Lomond High, Ogden, UT  
NAS Whidbey Island, WA

Susan N. Kronenberger, 27; MS Massachusetts Institute of Technology  
Stamford, NY; Schoharie Central School  
Shell Oil Co., Houston, TX

Maj. Richard O. Neel, 38, USAF; MSEE Purdue University  
 Mooresville, NC; Mooresville High  
NASA Johnson Space Center, Houston, TX

Maj. Thomas L. Vollrath, 33, US Army; MS University of Michigan  
Indianapolis, IN; Northern High  
US Army, Washington, D.C.

Maj. Robert E. Yeend, 36, US Marine Corps; MS Oregon State University  
Spokane, WA; Central Catholic High  
US Navy, Washington, D.C.

###

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Lyn Cywanowicz

For Release

RELEASE NO: 80-025

April 17, 1980

## 54-HOUR SIMULATION

Flight controllers, engineers and astronauts at the Johnson Space Center will participate in a 54-hour mock flight of the Space Shuttle Orbiter Columbia beginning on Tuesday April 22.

Over 500 people will be involved in the "flight" including -- for the first time -- Shuttle Program Office and prime contractor representatives.

Launch time is 8 a.m. CST, and landing is scheduled for 2 p.m. on Thursday for this simulation.

Flight Directors Neil B. Hutchinson, Charles R. Lewis and Donald R. Puddy with their teams of flight controllers will monitor Orbiter systems from the Mission Control Center.

- more -

Astronauts Joe H. Engle and Richard H. Truly will be performing tasks such as navigation, startracking and stowage in the Shuttle Mission Simulator. Engle and Truly are the backup crew for Columbia's first flight.

A previous simulation, 30 hours in duration, was conducted in January. According to M.P. Frank, Chief, Flight Control Division, "this sim has been extended to 54 hours -- full duration of Columbia's first mission -- to gain a more realistic response from the flight controllers."

"The simulation is designed to bring together and verify all aspects of the flight," says Frank.

Another 54-hour simulation is scheduled for early June and several more are planned before Columbia is launched late this year or early next year.

###



# NASA News

National Aeronautics and  
Space Administration

Lyndon B. Johnson Space Center  
Houston, Texas 77058  
AC 713 483-5111

---

Terry White

For Release

RELEASE NO: 80-026

April 25, 1980

## NASA SCREENS SIXTH ASTRONAUT APPLICANT GROUP

Astronaut applicant group six Monday will begin a week of physical exams and interviews at the NASA Johnson Space Center.

Group six has 21 applicants: 12 pilots and nine mission specialists, of whom three are women. Astronaut candidates selected from the 3122 men and women who applied in the fall of 1979 will begin a year's training in July 1980.

Names, college, birthplaces, high school, and current employer or duty station of applicants in group six are:

- more -

Pilots:

Maj. Joseph T. Anderson, 34, US Marine Corps; MS University of Southern California

Detroit, MI;

Marine Corps Air Station, Cherry Point, NC

Capt. Robert F. Behler, 32, USAF; MS University of Oklahoma

Rome, NY; Norman High

USAF Flight Test Center, Edwards, AFB, CA

Maj. Gary D. Bohn, 36, USAF; MS Air Force Institute of Technology

Halstead, KS; Halstead Rural High

Tyndall AFB, FL

LtCol. Frederick T. Bryan, 38, US Marine Corps; MS Naval Postgraduate School

Melrose, MA; Watertown High

Pacific Missile Test Center, Point Mugu, CA

LtCdr. David H. Finney, 35, US Navy; MS Naval Postgraduate School

Springfield, TN; Auburn High

Naval Air Test Center, Patuxent River, MD

Maj. Kerry E. Killebrew, 33, USAF; MS University of Southern California

Murray, KY; Overton High

Edwards AFB, CA

Capt. Marvin L. Martin, 33, USAF, MS Stanford University

Nevada, MO; Nevada High

Edwards AFB, CA

Maj. Gary W. Matthes, 38, USAF; MS Purdue University

St. Louis, MO; Fairview High

Edwards AFB, CA

LtCdr. Larry G. Pearson, 36, US Navy; MS Naval Postgraduate School  
Redlands, CA; Harlandale High  
7th Fleet, FPO San Francisco, CA

Mission Specialists:

Jerome Apt, 31; PhD Massachusetts Institute of Technology  
Springfield, MA; Shady Side Academy, Pittsburgh, PA  
Jet Propulsion Laboratory, Pasadena, CA

Lt. John M. Cherry, 32, US Navy; MS University of Hawaii  
Brooklyn, NY, Robinson High  
Underwater Construction Team 2, Port Hueneme, CA

Katherine R. Daues, 26; MS University of Houston  
LaMarque, TX; Dickinson High  
Getty Oil Co., Houston, TX

Lucia R. Garcia-Iniguez, 26; BA Rollins College  
Havana, Cuba; Glades Day School  
University of Texas Medical School, Houston, TX

Capt. David C. Hilmers, 30, US Marine Corps; MS Naval Postgraduate School  
Clinton, IA; Central Community High  
Marine Corps Hq, Washington, D.C.

Maj. Frank D. Lewis, 35, USAF; MS Air Force Institute of Technology  
Ft. Devens, MA; South Side High  
Wright-Patterson AFB, OH

Richard D. Newton, 31; PhD Texas A&M University

Baytown, TX; Robert E. Lee High

Texas A&M University, College Station, TX

Capt. George C. Nield, IV, 29, USAF; MS Stanford University

Washington, D.C.; Annandale High

Stanford University, CA

Mary M. Page, 34; PhD University of Tulsa

Tulsa, OK; Monte Cassino High

Robertson Research Inc., Houston, TX

James R. Simons, 32; BS USAF Academy

Glasgow, MT; Fergus County High

119th Fighter Interceptor Sqdn, (Reservist-civilian) Atlantic City, NJ

Richard J. Terrile, 29; PhD California Institute of Technology

New York, NY; John Bowne High

Jet Propulsion Laboratory, Pasadena, CA

Bill A. Williams, 38; PhD University of Illinois

Oakland, CA; Carlmont High

NASA Ames Research Center, Moffett Field, CA

# NASA News

National Aeronautics and  
Space Administration

Lyndon B. Johnson Space Center  
Houston, Texas 77058  
AC 713 483-5111

---

Terry White

For Release

RELEASE NO: 80-027

April 28, 1980  
2 p.m. CDT

## NASA AWARDS UNIVAC DATA PROCESSING CONTRACT

The NASA Johnson Space Center has signed a firm-fixed price contract with Sperry Corporation Univac Division of Houston covering lease and maintenance of automatic data processing equipment at the Center.

Valued at \$6.15 million, the contract covers people, equipment, materials, facilities, services and management to maintain all Univac data processing facilities at JSC.

###

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Kay Ebeling

For Release

RELEASE NO: 80-028

Upon Receipt

## VISITORS TO JOHNSON SPACE CENTER CAN

### WALK THROUGH NEW SPACE SHUTTLE CARGO BAY DISPLAY

A new display at Johnson Space Center will allow visitors to walk through a fullscale Space Shuttle cargo bay, see and touch replicas of Space Shuttle equipment, and in the future watch real-time video transmissions from onboard cameras during space missions.

The 15-by-50 foot payload bay display opened for the public Saturday, April 26. The exhibit was a main attraction at the 1979 Paris Air Show after which it was dismantled and shipped to JSC to become a permanent part of the visitor program. It now sits at the south end of the Visitor Center (Building 2).

Visitors can enter the mockup (shortened 10 feet for installation) by a ramp, then walk through the Orbiter's payload bay. Cargo in the exhibit will change with each mission of the Space Shuttle: the cargo on display today is a model of Spacelab, the European Space Agency's pressurized laboratory which will be carried onboard the Shuttle in the 1980's. Planned for the near future as cargo is a model of a commercial satellite ready to be deployed into space.

Release no: 80-028

Visitors will walk through the payload bay and out onto a pallet where experiments are exposed to the environment of space. They will then walk back to "Earth" via a ramp at the rear of the space ship.

A mannequin astronaut hovers just outside the model in a full spacesuit and jet backpack, demonstrating crew work outside the Orbiter. On display in the future will be a replica of the remote maneuvering arm, or space crane, that will be used on the Shuttle to deploy and retrieve satellites in space.

"With this exhibit people will be able to get the effect and relate to the size of the Shuttle's cargo-carrying capacity," Chuck Biggs, chief of the Public Services at JSC, said.

Until the first Space Shuttle mission, tapes of flight simulations will play inside the exhibit. Later, live TV of each mission as it takes place will be patched into the exhibit.

Displays continue to change at the space center. In the past year, Building 9A, containing a full-sized Orbiter mockup used for astronaut training, and Building 31, with Apollo program moon rocks on display, opened to the public.

The Center is open for visitors from 9 a.m. to 4 p.m. every day except Christmas. JSC is about 20 miles southeast of downtown Houston.

For additional information about these exhibits or tours at the Center, call 713/463-4241.

###

April 30, 1980

NASA-JSC

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Terry White

For Release

RELEASE NO: 80-029

May 1, 1980

## NASA CONTRACTS DRAPER LAB FOR SHUTTLE AVIONICS SOFTWARE

The NASA Johnson Space Center has signed a cost-plus-fixed-fee contract with the Charles Stark Draper Laboratory, Inc., of Cambridge, Massachusetts for development of Shuttle Orbiter avionics software.

Valued at \$12,931,464, the non-competitive contract has a 21-month duration starting April 29. The Draper Laboratory will perform the bulk of the work at Cambridge, with some at Rockwell International Space Division, Downey, California and at Johnson Space Center.

###



# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

David Garrett  
Robert Gordon

For Release

1 P.M., Thursday  
May 1, 1980

Release No: 80-030

## SHUTTLE COLUMBIA'S FLIGHT ENGINES TO BE RETESTED

The three Space Shuttle main engines designated for the first flight of the orbiter Columbia will be tested again to assure operational readiness for the flight.

The engines, acceptance tested between April and July 1979, will be shipped from the Kennedy Space Center, Fla., to the NASA testing facility in Mississippi for reacceptance firings.

The testing will take two to three months and is expected to have no effect on the timing of the Space Shuttle's first flight, now anticipated between November 1980 and March 1981.

-more-

The decision to retest the engines was based on the number of modifications that have been made during the past year. These modifications concerned high pressure turbopumps, valves and nozzles.

Each engine will be operated on the test stands at the National Space Technology Laboratories, Bay St. Louis, Miss. After the tests, the engines will be returned to Kennedy for installation in the Columbia.

About six weeks before the first flight, the engines will be fired once again, for 20 seconds, on the launch pad.

###

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Robert Gordon

For Release

RELEASE NO: 80-032

May 9, 1980

## SPACE SOLAR CELL CONTRACT

NASA has selected two California-based aerospace firms for negotiations leading toward contracts on the production of solar cells planned for use aboard a supplemental power source for the Shuttle Orbiter.

The two firms are Applied Solar Energy Corp., City of Industry, California, and Spectrolab, Sylmar, California. Each firm will receive a \$300,000 contract to develop a low cost, large area solar cell which can be used in NASA's proposed Power Extension Package. The contract also calls for the contractors to develop the production, testing and qualification capabilities and or potential necessary to meet the production requirements of about 144,000 space qualified solar cells during a 12-month period.

- more -

NASA's goal in this contract effort is to reduce the production cost of space solar cells to \$30 per watt. Current space solar cells cost \$80-\$120. Solar cell requirements for the power extension program represent a significant percentage of the total power extension program cost which means that a low cost, mass produced solar cell is required.

The power extension program is designed as a 2,000 pound package that can be folded into the Shuttle Orbiter's cargo bay. When in orbit an astronaut would use the Orbiter's 50-foot long remote mechanical arm to move the power package and place it in space in front of the Orbiter. Then, by command, the packages' two 177-foot long wings will be unfolded. The wings are about 12 feet wide and will be covered with the new low cost solar cells which convert the sun's energy into electrical power.

The power package will be able to furnish 26 kilowatts of electrical power for Shuttle use. The Orbiter's primary source of electrical power comes from three on-board fuel cells which produce up to 21 kilowatts. The added power of the extension package will augment experiments and other activities which require more power than can be produced by the Orbiter fuel cells.

At the end of a mission the extension package would be retrieved and loaded in the cargo bay for use on subsequent flights.

The contracts comprise the first of two phases, the second being the actual production effort of 12,000 cells per month over a years period.

###

# NASA News

National Aeronautics and  
Space Administration

Lyndon B. Johnson Space Center  
Houston, Texas 77058  
AC 713 483-5111

---

Lyn Cywanowicz

For Release

RELEASE NO: 80-033

Upon Receipt

## FEDERAL WOMEN'S PROGRAM WEEK, MAY 13-16

"Discovery" this year's theme for JSC's Federal Women's Program Week, concentrates on men and women working together and the conflicts both face with women subordinates, peers and supervisors.

Venita Van Caspel, is featured as the keynote speaker at the opening day luncheon, May 13. Van Caspel is president of Van Caspel & Company, Inc., Stockbrokers in Houston. She is also a Certified Financial Planner, author, TV personality and community leader.

Other featured speakers include: Jere E. Talley, Project Director, Recruitment and Training Program, Inc.; Von Nash, President, Von Nash Co.; Sue Burnett, General Manager, Burnett Personnel Consultants; Dr. Dale Hill, Psychotherapist, Houston, Texas; Jan Segerstrom, President, Triad Interests, Inc.; and Robert Horton, Houston Clean City Commission.

Activities for the program will be held at the Gilruth Recreation Center and the public is invited to attend.

For additional information contact Elsie Easley at 483-4311.

- more -

## Schedule of FWP Activities

Tuesday, May 13, 1980

- 11:30 Luncheon, Gilruth Recreation Center, large banquet room
- Welcome - Christopher C. Kraft
- Introduction of Keynote Speaker - Virginia Gibson
- Keynote Speaker - Venita Van Caspel, President,  
Van Caspel & Co., Inc., Stockbrokers, Houston,  
Texas
- Award Presentation - Virginia Hughes

Wednesday, May 14, 1980

- 9:00 Program on Interviewing (Interviewer/Interviewee) -  
Jere E. Talley, Project Director, Recruitment and  
Training Program, Inc., Women's Employment Division,  
Houston, Texas
- 11:30 Film - What You Are Isn't Necessarily What You Will  
Be - Dr. Morris Massey
- 1:00 Turning On Your Own Key - Von Nash, President, Von  
Nash Co., Austin, Texas

Thursday, May 15, 1980

- 9:00 Women Are Not Special - Sue Burnett, General Manager,  
Burnett Personnel Consultants, Houston, Texas
- 12:30 Pleasure and Pain of Competing - Dr. Dale Hill,  
Psychotherapist, Houston, Texas

Friday, May 16, 1980

- 9:00 Discover Yourself - Jan Segerstrom, President, Triad  
Interests, Inc., Houston, Texas
- 1:00 Putting It All Together - Robert Horton, Houston Clean  
City Commission, Houston, Texas

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Robert Gordon

For Release

RELEASE NO: 80-034

May 12, 1980

## COMPLEX SIM TESTS RMS

Parts of the remote manipulator system, the first space robot-like crane which will handle inflight transfer of Space Shuttle cargo, are currently undergoing testing in one of the most complex simulations conducted at NASA's Johnson Space Center.

The remote manipulator system (RMS) is an intricate machine being developed for NASA by the National Research Council of Canada. It is planned for use aboard the Shuttle Orbiter, beginning with the second flight. The manipulator system will be used for a number of tasks including placing or retrieving satellites in space, assembly of structures or components, and if necessary the rescue of crews from an inoperative vehicle. The manipulator would transfer the crew from a disabled vehicle to the rescue vehicle.

- more -

Spar Aerospace Products, Ltd., is under contract to the Canadian government to design, build and test the manipulator system. NASA recently signed a \$63.6 million contract for the production and delivery of three additional manipulator systems. The first flight item, scheduled for delivery to the Kennedy Space Center, Florida, later this year, was built by the Canadians at no cost to NASA.

The system consists primarily of a 50-foot long arm with movable joints at the shoulder, elbow, and wrist, plus associated motors, gears, sensors, and an end effector which serves as the arm's ingenious hand. Also included in the system are cockpit controls and displays and electronics which control the arm and provide an interface with the Orbiter flight computers.

The test at JSC, which began several weeks ago, involves four separate flight-type parts of the system. These are coupled with the Orbiter flight computer with corresponding flight software, or programming, in the Shuttle Avionics Integration Laboratory (Building 16). The laboratory is an engineering tool for development, checkout, and verification of flight systems long before the flight hardware is flown in space.

The parts being tested, which were recently delivered from Canada, are the display and control panel, rotational and translational hand controllers and the manipulator controller interface unit. The interface unit is part of the electrical subsystem which operates the manipulator. The arm and its movement is simulated by laboratory computers.



Jon H. Brown, special assistant in the Shuttle Avionics Integration Division at JSC, said these RMS pre-acceptance tests (R-pat for short) are designed to complement the Canadian acceptance tests of the remote manipulator system scheduled for use on the second Shuttle flight. In addition, the tests provide an opportunity to check laboratory systems in advance of the formal verification tests scheduled later in the year.

Astronauts, NASA and contractor engineers and technicians and representatives of Spar and the Canadian Research Council are attempting to duplicate events and circumstances astronauts would face operating the space crane in orbit. These computer simulations can both predict and mimic, with amazing fidelity, the realities of spaceflight.

Astronauts Sally Ride, Judy Resnick, Dr. Story Musgrave, and Dr. Norm Thagard are actually controlling the arm's movement by using the rotational or translational hand controllers in a mockup of the Orbiter aft station. Operators of the system manipulate the controls while looking at a computer-generated television scene which duplicates the view the crew would have out the aft window of the cockpit.

Brown explained that one of the difficulties astronauts will face in operating the mechanical arm is the dynamics induced by movement of the arm. In the weightlessness of space once a mass is set in motion (the arm and attached payload), it will keep going until it is stopped by an equal and opposite force.

As a result each time the arm is commanded to move, the control system must eventually deliver a command to counteract this motion. Reactions from the arm movement cause the Orbiter to move, and vice versa.

Possible interaction of the arm's control system with that of the Orbiter is an area which must be fully explored prior to flight. The laboratory simulation required to perform this investigation is among the most sophisticated ever attempted at JSC.

As in all manned space simulations numerous problems are fed into the system. The manipulator sims are no different.

According to Brown, ample problem situations as well as normal operations are built into the sims. "It is extremely complex," Brown said.

###

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**

Houston, Texas 77058  
AC 713 483-5111

---

Lyn Cywanowicz

For Release

RELEASE NO: 80-035

May 13, 1980

## BARBIOS SELECTED FOR CONTRACT NEGOTIATIONS

The NASA Johnson Space Center, Houston, Texas, has selected Barrios and Associates of Dickinson, Texas, for negotiations leading to the award of a cost-plus-award-fee contract. The contract covers flight design support services for operational flights of the Shuttle Transportation System.

The initial two years of the planned five-year program will run from June 1, 1980 through May 1982, at a cost of \$1.9 million.

Other bidders were: Jefferson Assoc., Houston, Texas; Nelson and Johnson Engineering, Boulder, Colorado; Chimex Systems, Houston Texas; and CAO Corp., Beltsville, Maryland.

###

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Robert Gordon

For Release

RELEASE NO: 80-036

May 15, 1980

ALSO RELEASED AT NASA HEADQUARTERS

## COLUMBIA FLIGHT ENGINES RETEST SCHEDULED

The retesting of the Space Shuttle Columbia's main engines, announced early this month, will consist of a single, 520-second, static firing for each engine.

The test stands at the National Space Technology Laboratories, Bay St. Louis, Mississippi, will be used for the tests. Engine 2007 has been mounted in test stand A-2 and is scheduled for static firing in late May. Engine 2006, to be mounted on stand A-1, will be tested in mid-June. Engine 2005 is to be tested on stand A-2 in late June.

- more -

NASA has scheduled reacceptance tests for the main engines because of modifications made to the engines since the original acceptance tests were conducted in April and July 1979.

Testing is conducted by Rockwell International's Rocketdyne Division, Canoga Park, California, for NASA's Marshall Space Flight Center, Huntsville, Alabama, which is responsible for development and testing of the Space Shuttle main engines.

###

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Bob Gordon

For Release

RELEASE NO: 80-037

Upon Receipt

ALSO RELEASED AT NASA HEADQUARTERS

## ORBITAL FLIGHT TEST PROGRAM EXTENDED

NASA has extended the date for completion of the first four Space Shuttle orbital flight tests to April 1982. The extension of the flight test program has made it necessary to reschedule the first operational flight of the Columbia, STS-5, from March 1982 to September 1982.

The decision to extend the flight test program and reschedule STS-5 is the result of several factors, the major being continuing engineering assessment and improvement of the Thermal Protection System.

Additionally, it is felt that there should be more time allowed for necessary engineering tasks during the orbital flight tests, and that a concerted effort should be made to effect a smooth and structured transition from the orbital flight tests to the operational phase of the Space Shuttle Program.

- more -

The first operational flight will launch the Tracking and Data Relay Satellite-A (TDRS-A) into a geosynchronous orbit according to the Space Transportation System operations manifest currently being revised.

The operational launch schedule, reflecting the extended test program adjustment will be discussed in detail with Shuttle users at a conference to be held May 29 and 30 at Kennedy Space Center, Florida.

Changes in the operations manifest have been coordinated with the Department of Defense, a major user of the Space Shuttle.

During the transition to full Space Shuttle operations, NASA will employ the Delta 3910 and the updated Delta 3920 launch vehicles. In addition to NASA, other organizations expected to use these launch vehicles include Telesat of Canada, Indonesia and Hughes Aircraft.

To provide timely launches and to accommodate 3900-series Deltas for these and other Delta users, modification of Launch Complex 17-B at the Kennedy Space Center is being considered.

March 1981 is now the most probable time for first launch of the Space Shuttle (STS-1). The completion of the Thermal Protection System and its mechanical integrity remain the prime technical concern of the Shuttle development program.

###

May 27, 1980

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Terry White

For Release

RELEASE NO: 80-038

May 29, 1980  
10 a.m. CDT

## NASA SELECTS 19 ASTRONAUT CANDIDATES

The National Aeronautics and Space Administration today announced the selection of 19 new astronaut candidates for the Space Shuttle Program. The new group of candidates will report to the Johnson Space Center July 7, 1980, to begin a one-year training and evaluation program.

Of the 19 selected, eight are pilot candidates and 11 are mission specialist candidates. Two of the mission specialist candidates are women. One pilot candidate is black and one mission specialist is Hispanic. The new group of candidates includes William F. Fisher, the husband of Anna Fisher, who was selected for the astronaut candidate program in 1978. Six civilians, including three current employees of the Johnson Space Center, and 13 military candidates were selected.

- more -



NASA received 2880 applications for mission specialist positions and 585 for pilot positions. Of these, 121 finalists were interviewed and given detailed medical evaluations at NASA's Johnson Space Center, Houston, Texas.

After one year of training and evaluation at the Johnson Space Center, successful candidates will become astronauts and enter the Shuttle training program leading to selection for Shuttle flight crews.

Pilots will operate the Space Shuttle Orbiter, maneuvering it in Earth orbit and flying it to Earth for a runway landing.

Mission specialist astronauts will have the overall responsibility for the coordination, with the commander and pilot, of Space Shuttle operations in the areas of crew activity planning, consumables usage, and other Space Shuttle activities affecting experiment operations. They may participate in extravehicular activities (space walks), perform special payload handling or maintenance operations using the Space Shuttle remote manipulator system, and assist in specific experiment operation at the discretion of the experiment sponsor.

A list of the new astronaut candidates is attached.

###

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Terry White

For Release

RELEASE NO: 80-039

June 10, 1980

ALSO RELEASED AT NASA HEADQUARTERS

## INVESTIGATORS FILE REPORT ON CAUSE OF SPACESUIT BACKPACK FIRE

A NASA board investigating the April 18 flash fire in a spacesuit backpack found where the fire started and recommended 11 ways to improve safety and reliability of the system.

While the exact cause was not found, the four most probable causes of ignition were cited in the board's report to Johnson Space Center Director Christopher C. Kraft, Jr., after five weeks of engineering detective work that included more than 2,000 unsuccessful attempts to reproduce the fire.

The accident destroyed an unoccupied Space Shuttle spacesuit and life support backpack. A Hamilton Standard technician, Robert A. Mayfield, was severely burned but is recovering and has been released from the hospital.

- more -

These tests are conducted to assure that such malfunctions are discovered prior to flight, since such an accident during a mission might well cause serious injury or fatality, or require premature termination of the mission.

The fire apparently started when the technician switched the secondary oxygen pack to the "spacewalk" position during a performance test in a clean room in the Crew Systems Laboratory. The secondary pack is attached to the bottom of the main backpack and provides 30 minutes of emergency oxygen for breathing and to maintain suit pressure if the main oxygen source fails.

Ignition took place in a V-shaped passage which serves to restrict the flow of oxygen between a shut-off valve and a chamber in the pack's regulator module, the investigating board determined. It said the four most probable causes were:

1. Heating by compression or shock of a thin section of aluminum between the flow restrictor passage and the adjacent cavity.
2. Heating by compression or shock of contaminants in the flow restrictor.
3. Heating of internal surfaces through mechanical shock of incoming high-pressure oxygen, or heating of particles.
4. Similar heating of shut-off valve o-rings.

The board found that all procedures followed during the April 18 test were proper. The regulator module had 19 cycles with high-pressure oxygen prior to the accident.

Technicians were unable to duplicate the failure in tests at Johnson's White Sands Test Facility, Las Cruces, New Mexico. Four regulator modules of the same factory batch were cycled 2,228 times. Post-test disassembly revealed significant contamination within the modules.

A regulator module is machined from a single block of aluminum and is fitted with valves, a pressure gauge and two step-down regulators that reduce oxygen supply pressure from 6,000 to 3.5 pounds per square inch. The flow restrictor consists of two 1/16-inch diameter drilled passages that intersect. It is between the high pressure inlet and the first stage regulator.

After ignition on April 18, the regulator module burned through and an oxygen-rich jet of flame burned the lower torso of the attached spacesuit.

The board ruled out backpack and clean room electrical systems as ignition sources. It said all clean room support feed lines were pure.

The 11 recommendations of the board are:

° Redesign high pressure oxygen valves and regulators so that debris cannot be trapped and eliminate "stagnation points" where heating by compression and shock can occur.

° Redesign regulator modules to lessen chance of internal contamination, while improving manufacturing inspection techniques.

° Review the design of all Space Shuttle high pressure valves and regulators for debris traps and unprotected o-rings.

° Replace existing silicone o-rings with silicone o-rings having improved ignition resistance.

° Machining regulator module body from monel instead of aluminum would reduce ignition potential.

° Inspect completed regulator modules with X-rays.

° Consider using neutron radiography to confirm that o-rings and other non-metallic components with significant hydrogen content are properly installed.

° Machine a dummy regulator module body from a block of clear plastic to verify wall thicknesses and other passageway machining tolerances.

° Consider comparison impact ignition testing of Teflon or Kel-F backup rings as a means of reducing shock heating of silicone o-rings.

° Clarify internal NASA specifications.

° Consider establishing a committee consisting of NASA and non-NASA personnel to collect existing high-pressure oxygen data, review and clarify existing design standards and requirements, recommend any necessary supplements to presently available information and publish a comprehensive standard for the design and use of high-pressure oxygen equipment used in the space program.

The investigating board was headed by Chester A. Vaughan, propulsion engineer. Members were: Noel Willis, Jr., crew systems engineer; George D. Nelson, astronaut; Joseph Degioanni, flight surgeon; and James B. Chappée, safety engineer. Andrew J. Hoffman of Hamilton Standard served as ex-officio member, and R. L. Johnston, materials engineer, served as advisor.

###

ASTRONAUT CANDIDATES

James P. Bagian	Civilian	Mission Specialist
LT COL John E. Blaha	US Air Force	Pilot
Major Charles F. Bolden, Jr.	US Marine Corps	Pilot
LT COL Roy D. Bridges, Jr.	US Air Force	Pilot
Franklin R. Chang	Civilian	Mission Specialist
Mary L. Cleave	Civilian	Mission Specialist
Bonnie J. Dunbar	Civilian	Mission Specialist
William F. Fisher	Civilian	Mission Specialist
Major Guy S. Gardner	US Air Force	Pilot
Major Ronald J. Grabe	US Air Force	Pilot
Capt. David C. Hilmers	US Marine Corps	Mission Specialist
LT David C. Leestma	US Navy	Mission Specialist
John M. Lounge	Civilian	Mission Specialist
Major Bryan D. O'Connor	US Marine Corps	Pilot
LCDR Richard N. Richards	US Navy	Pilot
Capt. Jerry L. Ross	US Air Force	Mission Specialist
LCDR Michael J. Smith	US Navy	Pilot
Major Sherwood C. Spring	US Army	Mission Specialist
Major Robert C. Springer	US Marine Corps	Mission Specialist

**NAME:** James P. Bagian, M.D.

**BIRTH DATE AND PLACE:** 2-22-52 - Philadelphia, Pennsylvania

**CURRENT RESIDENCE:** Philadelphia, Pennsylvania

**EDUCATION:** Central High School - Philadelphia, Pennsylvania  
BS, Mechanical Engineering, Drexel University, 1973  
MD, Medicine, Thomas Jefferson University, 1977

**PRESENT POSITION:** Anesthesiology Resident  
Hospital of the University of Pennsylvania  
Philadelphia, PA

(Currently on leave of absence from the Medical  
Sciences Division of the NASA Johnson Space Center)

**PARENTS:** Mr. & Mrs. Philip Bagian of Philadelphia, Pennsylvania

*telics  
address*

---

**NAME:** Franklin R. Chang, PhD.

**BIRTH DATE AND PLACE:** 4-5-50 - San Jose, Costa Rica

**CURRENT RESIDENCE:** Jamaica Plain, Massachusetts

**EDUCATION:** Hartford Public High School, West Hartford, Connecticut  
BS, Mechanical Engineering, University of Connecticut, 1973  
PhD, Physics, Massachusetts Institute of Technology, 1977

**PRESENT POSITION:** Physicist  
The Charles Stark Draper Lab, Inc.  
555 Technology Sq.  
Cambridge, MA 02139

**PARENTS:** Mr. & Mrs. Ramon A. Chang of Escazu, Costa Rica



**NAME:** John E. Blaha, LT. COL., US Air Force

**BIRTH DATE AND PLACE:** 8-26-42 - San Antonio, Texas

**CURRENT RESIDENCE:** Springfield, Virginia

**EDUCATION:** Granby High School, Norfolk, Virginia  
BS, Astronautical Engineering, USAF Academy, 1965  
MS, Astronautical Engineering, Purdue University, 1966

**PRESENT POSITION:** Director, Air Combat Effectiveness  
Headquarters, U.S. Air Force  
Washington, DC

**PARENTS:** Father: Elmer C. Blaha (deceased)  
Mother: Frances E. Blaha of San Antonio, Texas

---

**NAME:** Charles F. Bolden, Jr., Major, US Marine Corps

**BIRTH DATE AND PLACE:** 8-19-46 - Columbia, South Carolina

**CURRENT RESIDENCE:** Great Mills, Maryland

**EDUCATION:** C. A. Johnson High School, Columbia, South Carolina  
BS, Electrical Engineering, USN Academy, 1968  
MS, Systems Management, University of Southern California, 1977

**PRESENT POSITION:** Test Pilot/Project Officer  
Naval Air Test Center  
Patuxent River, MD 20670

**PARENTS:** Father: Charles F. Bolden, Sr. (deceased)  
Mother: Ethel Martin Bolden of Columbia, South Carolina

**NAME:** Roy D. Bridges, Jr., Major, US Air Force

**BIRTH DATE AND PLACE:** 7-19-43 - Atlanta, Georgia

**CURRENT RESIDENCE:** Las Vegas, Nevada

**EDUCATION:** Gainesville High School, Gainesville, Georgia  
BS, Engineering Science, USAF Academy, 1965  
MS, Astronautics, Purdue University, 1966

**PRESENT POSITION:** Special Project Officer  
HQ USAF  
Nellis Air Force Base  
Las Vegas, Nevada

**PARENTS:** Mr. & Mrs. Roy D. Bridges, Sr., Gainesville, Georgia

---

**NAME:** Guy S. Gardner, Major, US Air Force

**BIRTH DATE AND PLACE:** 1-6-48 - Altavista, Virginia

**CURRENT RESIDENCE:** Clark Air Force Base, Phillipines

**EDUCATION:** George Washington High School - Alexandria, Virginia  
BS, Aeronautical Engineering, USAF Academy, 1969  
MS, Aeronautical Engineering, Purdue University, 1970

**PRESENT POSITION:** Operations Officer  
1st Test Squadron  
Clark AFB, Phillipines

**PARENTS:** Father: Maxwell F. Gardner (deceased)  
Mother: Worthy Spence Gardner of Alexandria, Virginia

**NAME:** Mary L. Cleave, PhD.

**BIRTH DATE AND PLACE:** 2-5-47 - Southampton, New York

**CURRENT RESIDENCE:** Wellsville, Utah

**EDUCATION:** Great Neck North Senior High School, Great Neck, New York  
BS, Biology, Colorado State University, 1969  
MS, Botany, Utah State University, 1975  
PhD, Civil Engineering, Utah State University, 1979

**PRESENT POSITION:** Graduate Research Engineer  
Utah Water Research Laboratory  
Utah State University, UMC 82  
Logan, UT 84322

**PARENTS:** Mr. & Mrs. Howard E. Cleave of Williamstown, Massachusetts

---

**NAME:** Bonnie J. Dunbar

**BIRTH DATE AND PLACE:** 3-3-49 - Sunnyside, Washington

**CURRENT RESIDENCE:** Seabrook, Texas

**EDUCATION:** Sunnyside High School, Sunnyside, Washington  
BS, Ceramic Engineering, University of Washington, 1971  
MS, Ceramic Engineering, University of Washington, 1975

**PRESENT POSITION:** Flight Controller/Payload Officer  
Payload Operations Division  
Johnson Space Center  
Houston, Texas 77058

**PARENTS:** Mr. & Mrs. Robert C. Dunbar of Outlook, Washington

**NAME:** William F. Fisher, M.D.

**BIRTH DATE AND PLACE:** 4-1-46 - Dallas, Texas

**CURRENT RESIDENCE:** Seabrook, Texas

**EDUCATION:** North Syracuse Central High School, North Syracuse, New York  
BS, Psychology, Stanford University, 1969  
MS, Engineering Science, University of Houston, 1980  
MD, Medicine, University of Florida College of Medicine, 1975

**PRESENT POSITION:** Emergency Physician  
Emergency Department Physicians' Medical Group, Inc.  
4640 Admiralty Way, #508  
Marina Del Rey, CA 90291

**PARENTS:** Mr. & Mrs. Russell F. Fisher of Winter Park, Florida

---

**NAME:** David C. Hilmers, CAPT, US Marine Corps

**BIRTH DATE AND PLACE:** 1-28-50 - Clinton, Iowa

**CURRENT RESIDENCE:** Iwakuni, Japan

**EDUCATION:** Central Community High School, Dewitt, Iowa  
BS, Math, Cornell College, 1972  
MS, Electrical Engineering, Naval Postgraduate School, 1978

**PRESENT POSITION:** Officer in Charge  
Sub-Unit 2, Marine Wing Headquarters Squadron One,  
First Marine Aircraft Wing  
MCAS, Iwakuni, Japan

**PARENTS:** Mr. & Mrs. Paul C. Hilmers of Dewitt, Iowa

**NAME:** David C. Leestma, LT CMDR, US Navy

**BIRTH DATE AND PLACE:** 5-6-49 - Muskegon, Michigan

**CURRENT RESIDENCE:** Camarillo, California

**EDUCATION:** Tustin High School, Tustin, California  
BS, Aero. Engineering, US Naval Academy, 1971  
MS, Aero. Engineering, Naval Postgraduate School, 1972

**PRESENT POSITION:** Operational Test Director  
U.S. Navy Air Test & Evaluation Squadron  
Pt. Mugu, CA 93042

**PARENTS:** Mr. & Mrs. Harold F. Leestma of El Toro, California

---

**NAME:** John M. Lounge

**BIRTH DATE AND PLACE:** 6-28-46 - Denver, Colorado

**CURRENT RESIDENCE:** Friendswood, Texas

**EDUCATION:** Burlington High School - Burlington, Colorado  
BS, Math, USN Academy, 1969  
MS, Astrophysics, University of Colorado, 1970

**PRESENT POSITION:** Flight Controller/Payload Officer  
Payload Operations Division  
Johnson Space Center  
Houston, Texas 77058

**PARENTS:** Mr. & Mrs. Percy J. Lounge of Burlington, Colorado

**NAME:** Ronald J. Grabe, Major, US Air Force

**BIRTH DATE AND PLACE:** 6-13-45 - New York, New York

**CURRENT RESIDENCE:** Edwards AFB, California

**EDUCATION:** Stuyvesant High School, New York, New York  
BS, Engineering Science, USAF Academy, 1966  
MS, Aeronautics, Technische Hochschule, Darmstadt, Germany, 1967

**PRESENT POSITION:** Instructor Pilot  
USAF Test Pilot School  
Edwards Air Force Base, CA

**PARENTS:** Father: Hans H. Grabe (deceased)  
Mother: Martha Langpap Grabe of Lakewood, New Jersey

---

**NAME:** Bryan D. O'Connor, Major, US Marine Corps

**BIRTH DATE AND PLACE:** 9-6-46 - Orange, California

**CURRENT RESIDENCE:** Washington, DC

**EDUCATION:** 29 Palms High School, 29 Palm, California  
BS, Naval Science, USN Academy, 1968  
MS, Aeronautical Systems, University of W. Florida, 1970

**PRESENT POSITION:** Harrier Class Desk Officer  
Naval Air Systems Command  
Washington, DC 20361

**PARENTS:** Mr. & Mrs. Thomas J. O'Connor of San Diego, California

NAME: Richard N. Richards, LT CMDR, US Navy

BIRTH DATE AND PLACE: 8-24-46 - Key West, Florida

CURRENT RESIDENCE: California, Maryland

EDUCATION: Riverview Gardens High School, St. Louis, Missouri  
BS, Chemical Engineering, University of Missouri, 1969  
MS, Aeronautical Systems, University of W. Florida, 1970

PRESENT POSITION: Test Pilot/Project Officer  
Naval Air Test Center  
Patuxent River, MD 20670

PARENTS: Mr. & Mrs. M. R. Richards of St. Louis, Missouri

---

NAME: Michael J. Smith, LT CMDR, US Navy

BIRTH DATE AND PLACE: 4-30-45 - Morehead, South Carolina

CURRENT RESIDENCE: Virginia Beach, Virginia

EDUCATION: Beaufort High School - Beaufort, North Carolina  
BS, Aeronautical Engineering, USN Academy, 1967  
MS, Aeronautical Engineering, USN Postgraduate School, 1968

PRESENT POSITION: Pilot and Maintenance Officer  
Attack Squadron 75  
NAS Oceana  
USS Saratoga

PARENTS: Father: Robert L. Smith (deceased)  
Mother: Lucile Safrit Smith (deceased)

**NAME:** Jerry L. Ross, Captain, US Air Force

**BIRTH DATE AND PLACE:** 1-20-48 - Gary, Indiana

**CURRENT RESIDENCE:** Friendswood, Texas

**EDUCATION:** Crown Point High School, Crown Point, Indiana  
BS, Mechanical Engineering, Purdue University, 1970  
MS, Mechanical Engineering, Purdue University, 1972

**PRESENT POSITION:** Flight Controller/Payload Officer  
Payload Operations Division  
Johnson Space Center  
Houston, Texas 77058

**PARENTS:** Mr. & Mrs. Donald J. Ross of Crown Point, Indiana

---

**NAME:** Sherwood C. Spring, Major, US Army

**BIRTH DATE AND PLACE:** 9-3-44 - Hartford, Connecticut

**CURRENT RESIDENCE:** Camp Humphries, Korea

**EDUCATION:** Pongansett High School, Glocester, Rhode Island  
BS, Engineering, US Military Academy, 1967  
MS, Aero. Engineering, University of Arizona, 1974

**PRESENT POSITION:** Operations Officer  
HHD, 19th Aviation Battalion Combat  
Camp Humphries, Korea

**PARENTS:** Mr. & Mrs. Edward C. Spring of Stuart, Florida



**NAME:** Robert C. Springer, Major, US Marine Corps

**BIRTH DATE AND PLACE:** 5-21-42 - St. Louis, Missouri

**CURRENT RESIDENCE:** Virginia Beach, Virginia

**EDUCATION:** Ashland Senior High School, Ashland, Ohio  
BS, Naval Science, USN Academy, 1964  
MS, Operations Research, USN Postgraduate School, 1971

**PRESENT POSITION:** Force Requirements Officer  
Headquarters, Fleet Marine Force, Atlantic  
Norfolk, VA

**PARENTS:** Mr. & Mrs. Walter C. Springer of Ashland, Ohio

---

**NAME:**

**BIRTH DATE AND PLACE:**

**CURRENT RESIDENCE:**

**EDUCATION:**

**PRESENT POSITION:**

**PARENTS:**

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Kay Ebeling

For Release

RELEASE NO: 80-040

June 27, 1980

## JOHNSON SPACE CENTER ENGINEERS STUDY

### FUTURE SPACE CONSTRUCTION METHODS

Construction of large structures in space calls for innovations years in advance of the first project. Engineers at Johnson Space Center are working on automated methods to "space fabricate" structural beams and trusses in orbit to build space construction projects of the future.

A truss, much like one a "beam builder" in space would produce, recently arrived at JSC. Engineers here will run structural evaluation tests with it in early July. In these tests a hydraulic cylinder applies varying loads to the truss to test its stiffness and strength.

The test truss was made by General Dynamics-Convair Division and it is a product of three years' analysis, design, and testing of the automated fabrication approach to space construction.

- more -

A construction package the Space Shuttle carries into orbit must be lightweight and compact, yet able to carry materials with the strength and durability of a communications array or an antenna that remains in space for years, or the first beams for a structure that will house personnel in Earth orbit.

The beam builder being evaluated at JSC holds approximately 918 meters of graphite composite flat strip material rolled inside a storage canister. The roll turns on bearing-mounted rollers and unwinds uniformly. An access panel in the hinged half opens for the material to pass over the heating section guide rollers which form it into the required shape.

After forming, the material passes into the cooling section where aluminum platens cool one complete bay length of cap section during a 40-second pause. During the pause, crossmembers are ultrasonically welded in place to complete the truss.

Four friction rollers drive the material from the storage roll through the heating/forming/cooling sections and advance the beam out of the beam builder.

Methods other than space fabrication are also being studied at NASA. One approach is to make structures which can be folded into dense packages and stowed during launch, then deployed on-orbit into larger, lightweight space systems. Another approach is to use pre-fabricated, tapered tubular members and connectors which nest

inside each other as a package during launch and then are erected piece-by-piece in orbit into a large structure with the work of a remote manipulator or a suited crewmember.

Research into automated space beam building will continue at JSC over the next few years. The project is now in pre-development stages. In the next three to five years, JSC engineers hope to have a prototype flight machine at the space center for more specific development testing.

###

Photos available: S80-35208 The Deployable Space Truss Beam  
S80-35215 Beam fully deployed

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Terry White

For Release

RELEASE NO: 80-041

June 30, 1980

## NEW ASTRONAUT CANDIDATES

### REPORT FOR TRAINING

A new class of astronaut candidates will report July 7 to the NASA Johnson Space Center for a year's training. The 19 candidates were selected in May from among 121 applicants screened.

Management briefings and personnel office paperwork will fill the first two days before the group begins formal training. There are eight pilot candidates and 11 mission specialist candidates in the group. Six are civilian and 13 are military.

Following the year of training and evaluation at JSC, successful candidates will become astronauts available for Shuttle flight crew selection.

###

NOTE TO EDITORS: The candidates will be available for informal photos and responses to questions from 1 until 2 p.m. in the News Center Briefing Room, Bldg 2, Rm 135.

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Lyn Cywanowicz

For Release

RELEASE NO: 80-042

June 27, 1980

## JSC NAMES HARLAN TO SAFETY/QUALITY POST

Charles S. Harlan has been named acting deputy director for Safety, Reliability and Quality Assurance for NASA's Johnson Space Center effective July 7, 1980.

The SR&QA office sets policies and requirements for high standards of employee safety and equipment quality at JSC, and for space hardware quality at contract manufacturing plants.

Harlan joined NASA in June 1962, and has served as chief of the Payload Operations Division at JSC since November 1976. Earlier he was flight director for the Skylab Re-entry, and assistant flight director during the Apollo program.

He replaces William M. Bland, Jr. who retired from NASA in December 1979.

###

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Kay Ebeling

For Release

RELEASE NO: 80-043

Upon Receipt

## LOCAL HIGH SCHOOL STUDENTS WORK AT JSC THIS SUMMER

Fifteen students from local high schools are working at NASA Johnson Space Center this summer as part of a national inter-agency project to stimulate interest in careers in science and engineering.

The Research Apprenticeship Program started June 2 and runs through August 15. The first two weeks the students alternated days of hands-on laboratory research and workshops conducted by JSC Aerospace Education Specialists.

The students are now working in various directorates at the space center four days a week, with the fifth day reserved for review reports and field trips.

The students were chosen for the program after being recommended by high school counselors. They will be eligible for part-time employment at JSC at the conclusion of the summer program.

The students, their high schools, and the area at the space center where they are employed are listed below.

- more -

Yates High School

Cynthia Bates	Life Sciences Division
Ralph Cammack	Powers & Propulsion Division
Connie Carr	Earth Observations Division
Christine Fountaine	Earth Observations Division
Eric Morehead	Shuttle Simulator
Brenda Williams	Biochemistry Laboratory

Milby High School

Cari Beck	Crew Systems Division
Lionel Castro	Space Environment Test Division
Daphine Johnson	Neurophysiology Laboratory
Bertha Rodriguez	Medical Research Branch
Byron White	Telecommunications

Austin High School

Ricardo Cabrera	Spacelab Crew Compartment
Sergio Davila	Space Environment Test Division
Daniel Garza	Research Profile Data
Patrick Joseph	Computer Science

The program was developed by Office of Management and Budget Director Jim McIntyre and Frank Press, director of the Office of Science and Technology Policy together with special assistants to the President.

###



# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Terry White

For Release

RELEASE NO: 80-044

2 July, 1980

## MARTIN MARIETTA TO BUILD SHUTTLE ORBITER TILE REPAIR KITS

The NASA Johnson Space Center has amended its contract with Martin Marietta Corporation of Denver to cover Space Shuttle Orbiter tile repair kits. The kits would allow Orbiter crews to replace or repair lost or damaged thermal protection system (heatshield) tiles in earth orbit.

The \$2,066,193 supplement to the cost-plus-award-fee contract for Shuttle manned maneuvering units calls for delivery in September of two flight tile repair kits and one training kit. Total value of the contract is \$28,767,768. The work previously was begun under a letter contract formalized by this supplement.

###

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Debra J. Rahn  
NASA Headquarters

For Release  
Immediate

Terry White  
Johnson Space Center

July 7, 1980

RELEASE NO: 80-045

## TWO EUROPEANS ACCEPTED FOR SPACE SHUTTLE MISSION SPECIALIST TRAINING

NASA and the European Space Agency (ESA) announced today that two European scientists have entered NASA's Mission Specialist training program at the Johnson Space Center, Houston, Texas.

NASA has agreed to train the European scientists nominated by ESA in recognition of the substantial contribution ESA is making to the Space Transportation System by funding development of Spacelab. ESA will reimburse NASA for the costs of training the two European scientists.

The two European nominees have undergone a screening and selection process similar to that of U.S. applicants. They enter the mission specialist training program with the same commitment as candidates selected by NASA, that is, to undergo the full complement of mission specialist training in preparation for possible duty as mission specialists utilizing the Space Transportation System.

The two European nominees selected for training are:

- \* Claude Nicollier, 33, Swiss, an astronomer formerly at the European Space Technology Center, (ESTEC), Noordwijk, Netherlands; and

- \* Wubbo Ockels, 31, Dutch, a physicist formerly with Groenigen University, Netherlands. Both Nicollier and Ockels are now ESA employees.

Nicollier and Ockels are also ESA's Spacelab I Payload Specialists Candidates. The opportunity for mission specialist training arose when additional time became available for preparing for the Spacelab I mission currently scheduled for launch in May 1983.

###

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Kay Ebeling

For Release

RELEASE NO: 80-046

Upon Receipt

## CAN PLASMA IN THE IONOSPHERE BE USED TO AUGMENT SPACE SOLAR POWER?

Ionospheric plasma has long plagued spacecraft engineers. At altitudes the Space Shuttle Orbiter will fly, free-flowing five-volt particles can interfere or interface with spacecraft operations, especially space solar power systems.

In Johnson Space Center's huge vacuum chamber engineers have tested plasma interaction with spacecraft. After creating an ionospheric plasma using an argon thruster, they placed pieces of space hardware and materials into the chamber both to find ways to avoid damage to spacecraft and to investigate ways the plasma can be used as an augmenting power source for spacecraft.

At 65 feet in diameter and 120 feet tall, Vacuum Chamber A is the largest thermal-vacuum test chamber in the country.

The tests ended in mid-July and scientists are now analyzing the data. Tests with other spacecraft power and communication systems will resume in the fall.

- more -

Until now space solar power arrays have been designed to operate at voltages under 100 electron volts to avoid leakage currents through the surrounding space plasma.

NASA now proposes space power systems that will operate at voltage values from 200 to possibly 2000 volts. These systems would operate in Shuttle orbits where the thermal plasma environment (particle energies) is most dense.

Interaction between high-voltage areas of solar arrays and the plasma environment is possible.

A Power Extension Package (PEP) test article hung inside the chamber last month while test engineers brought the chamber ion density to that found at altitudes at which the PEP will fly. They then measured current leakage and voltage drops caused by the ionospheric plasma at different densities.

The PEP solar array, an augmenting power source for future Space Shuttle missions, is the first of this new generation of light-weight high-power solar arrays. These tests are the first time a flight-type solar array has been in a full-scale space simulation, with both a thermal vacuum and a plasma environment. The PEP ran at 26 kw, its full rated solar power output.

"Operation of large solar arrays at high voltage in low Earth orbit drives leakage currents through the surrounding plasma," said James McCoy, principal investigator for the project.

This results in power loss; however, use of the ionosphere could also result in power gain.

After the tests with the PEP, test engineers put objects of different shapes, sizes, and materials inside the chamber and subjected them to a variety of ion densities with various high voltages applied.

An ultimate goal of these tests is to find ways to make use of the ionosphere's free-flowing energy. "Perhaps by biasing the payloads or configuring them differently, we could use the ionosphere to generate power or to adjust the spacecraft's attitude," said John Stanley, test director.

The ionospheric plasma surrounds the Earth from 50 to over 2000 miles altitude. It consists of free electrically-charged particles created by ultraviolet rays from the Sun. Its density varies with the altitude, time of day, season, and solar cycles.

Presently problems have been identified with manned and unmanned spacecraft charging or discharging as a result of interaction with the ionosphere.

"A goal of these tests is to find a way to have positive rather than detrimental effects caused by the plasma." Stanley said.

"This plasma provides a source of electric current carriers which can be very significant for large structures or power sources in space," McCoy said.

###

July 23, 1980

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Lyn Cywanowicz

For Release

RELEASE NO: 80-047

July 23, 1980

## FEMALE AIR FORCE ACADEMY GRAD AT JSC

A 23-year old blue-eyed blonde and a May 1980 graduate of the Air Force Academy is a new face in the Air Force's Manned Space Flight Support Group at the Johnson Space Center. Dianne Langmade, a newly-commissioned Air Force second lieutenant is "very excited to learn about the Space Shuttle program from the ground -- up."

Langmade, one of the 98 women in the Academy's first class to graduate women, earned degrees in engineering and humanities. She said she applied for admission to the Academy "on a dare from friends -- they didn't think I would make it. It was tough but well worth it, you get a good education and meet people from all over the United States."

Langmade is also the first female Air Force officer to be assigned to the Johnson Space Center. "We were looking for someone with a technical background; we liked her credentials and offered her the position," said Lt. Col. John M. Reece, Air Force test and evaluation manager at JSC.

Langmade will join NASA flight controllers to learn to operate the thermal systems console in the Mission Control Center during Space Shuttle missions. She will be responsible for monitoring performance of the Orbiter's passive and active thermal control systems.

"Although I'm kept busy with training and stacks of reading material, I find the atmosphere at JSC much more relaxed than at the academy," she said. "Everyone has been very friendly and helpful since I've been here."

Langmade, who considers herself the "out-of-doors type" plans to spend her spare time fishing, playing tennis, skiing, riding horses and running (she was on the track team at the Academy).

Born and raised in Phoenix, Arizona, Langmade is the daughter of Mr. and Mrs. Robert H. Langmade. She says, "my parents and brothers Dale and Dan (twin brother) are very proud of my accomplishments and want to know all about what I'm doing."

Langmade will be stationed at JSC for the next three to five years and "so far" plans to make the Air Force her career.

###

Photographs are available

July 23, 1980



# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Terry White

For Release

RELEASE NO: 80-048

July 24, 1980  
2 p.m. CDT

## NASA EXTENDS NORTHROP AIRCRAFT MAINTENANCE CONTRACT

The NASA Johnson Space Center has extended for a year its contract with Northrop Worldwide Aircraft Services, Inc. of Webster, Texas, covering maintenance and modification of aircraft operated by the Center.

The contract extension is valued at \$7,227,000 with a maximum award fee of \$342,000. The cumulative value of the cost-plus-award-fee contract over its four years is \$25,356,752.

Covered under the contract are T-38 astronaut proficiency training aircraft, Grumman Gulfstream II Shuttle Training Aircraft, a Gulfstream I administrative transport, a KC-135 reduced-gravity simulation aircraft, and several aircraft in the Center's Earth Resources survey program.

###

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Robert Gordon

For Release

RELEASE NO: 80-049

August 7, 1980

## ASTRONAUT CANDIDATES ATTEND WATER SURVIVAL SCHOOL

Eight astronaut candidates from the NASA Johnson Space Center in Houston are scheduled to spend three days in training at the Homestead Air Force Water Survival School in Florida, beginning August 11.

Included in the eight that will take the training are two females and two European scientists who recently entered Mission Specialist training at the Johnson Space Center.

The activities will include classroom lectures on water survival techniques plus actual training in the water environment. Briefings on procedures precede each activity.

The two European scientists recently joined the NASA training program as Mission Specialists along with the 19 members of the new NASA astronaut candidate class. The Europeans are Claude Nicollier, 33, a Swiss astronomer who was formerly at the European Space Technology Center in the

more

Netherlands and Wubbo Ockels, 31, a dutch physicist formerly with Groenigen University, the Netherlands. They are employees of the European Space Agency, Paris, France.

Only six of the 19 new astronaut candidates are taking part in the water survival training before entering the NASA program.

The training includes jumping from a tower wearing a tethered parachute harness while sliding down a wire to a landing in the water. The candidates will also be towed through the water in a parachute harness, simulating a parachute dragging one across the surface and having to release one's self.

Other exercises will require the astronaut candidates to be towed aloft under a parasail canopy, land in the water, and be picked up by boat. On the final plunge into the water via parasail, the astronaut candidates will be coming down with full survival gear. A helicopter will pick them up from their life raft.

The USAF Water Survival School is operated by the 3613th Combat Crew training squadron with headquarters at Fairchild AFB, Washington.

The six NASA astronaut candidates taking part in the program are: (brief biographies included)

NAME: Franklin R. Chang, PhD.

BIRTH DATE AND PLACE: 4/5/50 - San Jose, Costa Rica

EDUCATION: Hartford Public High School, West Hartford, Connecticut  
BS, Mechanical Engineering, University of Connecticut, 1973  
PhD, Physics, Massachusetts Institute of Technology, 1977

FORMER POSITION: Physicist  
The Charles Stark Draper Lab, Inc.  
555 Technology Sq.  
Cambridge, MA 02139

PARENTS: Mr. & Mrs. Ramon A. Chang of Escazu, Costa Rica

NAME: Mary L. Cleave, PhD.

BIRTH DATE AND PLACE: 2/5/47 - Southampton, New York

EDUCATION: Great Neck North Senior High School, Great Neck, New York  
BS, Biology, Colorado State University, 1969  
MS, Botany, Utah State University, 1975  
PhD, Civil Engineering, Utah State University, 1979

FORMER POSITION: Graduate Research Engineer  
Utah Water Research Laboratory  
Utah State University, UMC 82  
Logan, UT 84322

PARENTS: Mr. & Mrs. Howard E. Cleave of Williamstown, Massachusetts

NAME: Bonnie J. Dunbar

BIRTH DATE AND PLACE: 3/3/49 - Sunnyside, Washington

EDUCATION: Sunnyside High School, Sunnyside, Washington  
BS, Ceramic Engineering, University of Washington, 1971  
MS, Ceramic Engineering, University of Washington, 1975

FORMER POSITION: Flight Controller/Payload Officer  
Payload Operations Division  
Johnson Space Center  
Houston, TX 77058

PARENTS: Mr. & Mrs. Robert C. Dunbar of Outlook, Washington

NAME: William F. Fisher, M.D.

BIRTH DATE AND PLACE: 4/1/46 - Dallas, Texas

EDUCATION: North Syracuse Central High School, North Syracuse, New York  
BS, Psychology, Stanford University, 1969  
MS, Engineering Science, University of Houston, 1980  
MD, Medicine, University of Florida College of Medicine, 1975

FORMER POSITION: Emergency Physician  
Emergency Department Physicians' Medical Group, Inc.  
4640 Admiralty Way, #508  
Marina Del Rey, CA 90291

PARENTS: Mr. & Mrs. Russell F. Fisher of Winter Park, Florida

NAME: Jerry L. Ross, Captain, US Air Force

BIRTH DATE AND PLACE: 1/20/48 - Gary, Indiana

EDUCATION: Crown Point High School, Crown Point, Indiana  
BS, Mechanical Engineering, Purdue University, 1970  
MS, Mechanical Engineering, Purdue University, 1972

FORMER POSITION: Flight Controller/Payload Officer  
Payload Operations Division  
Johnson Space Center  
Houston, TX 77058

PARENTS: Mr. & Mrs. Donald J. Ross of Crown Point, Indiana

NAME: Sherwood C. Spring, Major, US Army

BIRTH DATE AND PLACE: 9/3/44 - Hartford, Connecticut

EDUCATION: Pongansett High School, Glocester, Rhode Island  
BS, Engineering, US Military Academy, 1967  
MS, Aero. Engineering, University of Arizona, 1974

FORMER POSITION: Operations Officer  
HHD, 19th Aviation Battalion Combat  
Camp Humphries, Korea

PARENTS: Mr. & Mrs. Edward C. Spring of Stuart, Florida

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Eddy Wittry

For Release

RELEASE NO: 80-050

Upon Receipt

## NEW WATER TANK HELPS TRAIN FOR SPACE ZERO-GRAVITY TASKS

Almost everything about space--hard vacuum, temperature extremes, harsh sunlight--can be simulated on Earth, except the slow-motion weightlessness of space travel. Brief half-minute periods of zero-gravity, or weightlessness, can be duplicated by flying a roller-coaster path in an airplane, but neutral-buoyancy in a water tank is the only way to approximate long periods of weightlessness.

The NASA Johnson Space Center in Houston will begin using its new water immersion facility (WIF) in October for Space Shuttle crew training. Located in the round building formerly housing the Apollo manned centrifuge, the half-million gallon tank is expected to be valuable in training Shuttle flight crews for spacewalks, or what space engineers call "extravehicular activity--EVA."

Measuring 33 feet wide, 78 feet long and 25 feet deep, the new WIF holds as much as 25 average backyard swimming pools. It replaces a circular tank 25 feet in diameter and 16 feet deep built in the mid-sixties for Gemini and Apollo emergency water egress training.

- more -

JSC and Marshall Space Flight Center, Huntsville, Alabama, will provide WIF training mockups. Marshall will furnish some payload trainers while JSC builds others including a full-size Shuttle Orbiter payload bay.

The WIF filtering and chemical systems reduce bacteria and provide clear water needed in underwater photography.

Six submersible TV cameras follow training operations--two operated by divers and four mounted under water with pan, tilt, and zoom, manipulated from a console at the pool's edge.

The water will be heated to a constant temperature of 85 degrees for safety divers' comfort over long periods of time.

An overhead crane will lift the mockups and trainers out of the water and place them on a huge laydown area beside the pool. The air-powered five-ton crane eliminates electric shock hazard around the water.

The WIF has two air compressors that supply air to the astronauts during training and to fill scuba tanks.

Plans to construct an observation deck for visitors are also underway.

###

August 20, 1980

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Lyn Cywanowicz

For Release

RELEASE NO: 80-051

August 27, 1980

## TWO AEROSPACE FIRMS GET SATELLITE SERVICE SYSTEMS CONTRACTS

The NASA Johnson Space Center has awarded contracts to two aerospace firms to study and analyze the concept of a Satellite Services System for use during Space Shuttle operational flights.

The study will define a comprehensive program for servicing, repairing or returning to Earth satellites already in orbit. These capabilities will enable the satellite users to increase the efficiency of satellite operations and reduce the cost of doing business in space.

Grumman Aerospace, Bethpage, New York, and Lockheed Missles & Space Co., Inc., Sunnyvale, California, will conduct the nine-month two-part study at a total cost of \$327,508.

Part I of the study will define potential users, and the type of satellites and functions to be considered in the design of the system. Specific servicing functions, required equipment, operations, costs and schedules are also in Part I. Using the results of the first part of the study, Part II will define new equipment needed

- more -



and how existing equipment should be modified. Part II also covers equipment compatibility with the Space Transportation System.

NASA's Shuttle equipment such as remote manipulator system and manned maneuvering unit are the building blocks for the future service system.

With the operational Shuttle flights scheduled for late in 1982, the Satellite Service System will provide the satellite users with new equipment, better services and greater operational capabilities as the Space Transportation System's usage rate increases.

###

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Dave Alter

For Release

RELEASE NO: 80-052

Upon Receipt

## SHUTTLE CREWMAN TO SEND LIVE PICTURES ON SPACEWALK

NASA television engineers at the Johnson Space Center in Houston are modifying an Air Force television camera for live, real-time TV transmission by crewmen taking spacewalks outside the Space Shuttle Orbiter.

Like a third eye or miner's light mounted in his forehead, the camera is positioned in the astronaut's extravehicular visor assembly. It protrudes from the visor, seeing what he sees and transmits black and white scenes back to a TV monitor for a crewman in the spacecraft. Also, it may transmit live back to Earth, or record on board for later replay.

What the astronaut sees, the TV camera transmits.

He may be inspecting the glass-tile heatshield, or choose to view the latches, doors, or payloads.

The camera system allows the crewman inside to view the hardware and spacewalk activity while it happens, making joint decisions on repairs.

- more -

Three TV camera systems are being purchased: one for flight, a second for training and a third for testing, qualification and future use.

The camera system includes a battery pack, FM transmitter, antenna, and receiver in the Orbiter, along with other supporting hardware.

Cost of the three complete TV-camera systems including integration, testing and mission planning is estimated at \$750,000.

"This program will mark initial use of a solid state image sensor instead of vacuum tube," said Bernard C. Embrey, Jr., subsystem manager, Extravehicular Mobility Unit television.

Here is how the Space Shuttle Orbiter space television system works:

An astronaut dons his pressure suit, officially termed the Extravehicular Mobility Unit (EMU), and backpack with a portable life support system (PLSS), capable of supplying seven hours of oxygen. He then enters the payload bay through an airlock, where he hooks up to the Manned Maneuvering Unit (MMU) and moves laterally to the work platform. Powered by jets of nitrogen gas, the crewman taxis the station to inspect and photograph the Orbiter.

The camera's wide angle lens provides a 19.7 mm focal length with a 32 degree horizontal field-of-view. The lens range will be preset to keep the scenes in focus from about 15 inches to whatever distance is required.

###

September 2, 1980

NASA-JSC

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Terry White

For Release

RELEASE NO: 80-053

August 27, 1980

ALSO RELEASED AT NASA HEADQUARTERS

## ENGINEERING AND OPERATIONS SUPPORT CONTRACT AWARDED

NASA has selected McDonnell Douglas Technical Services Co., Inc. (MDTSCO), Houston, for negotiations leading to the award of a cost-plus-award-fee contract for performance of Space Transportation Systems Engineering and Operations Support.

The contract will be for technical and analytical support in the areas of engineering systems analyses, flight design, flight operations and management systems support.

The period of performance of this effort will be from October 1980 through September 1986, and will be divided into three equal contract increments. The contractor's estimated cost for the first two-year increment plus a firm two-year option is approximately \$25 million.

The contract will be under the management and technical direction of the Lyndon B. Johnson Space Center, Houston, Texas. Lockheed Engineering and Management Services, Houston, also submitted a proposal for the work.

###

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**

Houston, Texas 77058  
AC 713 483-5111

---

Dave Alter

For Release

RELEASE NO: 80-054

September 9, 1980

## LAB DISTILLS WASTE WATER FOR REUSE IN FLIGHT

NASA technicians are "flying" a strange deep space mission on a problem as controversial and perplexing today as it must have been when Noah closed his hatch for 40 days and 40 nights.

Noah, it is reported, with a bit of extraterrestrial help, acquired enough water to endure the trip (or opened the hatch to catch some downpour).

"Mother Nature, through her Earth-filtering process, has been purifying water for reuse since the days of Adam and Eve," points out Dean Thompson, project engineer at the Johnson Space Center in Houston.

No such luck in the vacuum of space where water and air must be produced.

Eight astronauts, on a 90-day mission in a Space Operations Center equipped with solar cells for power, will need water for

- more -

drinking, personal hygiene, conversion to oxygen and for additional cooling. Solar cells are expected to replace onboard water-producing fuel cell power plants.

The solution, say NASA scientists, is collecting and distilling urine, washwater, and perspiration.

The average crewman requires about a gallon of water a day, drinking about  $\frac{1}{2}$  gallon and consuming the rest in food, said Thompson. He urinates about  $\frac{1}{2}$  gallon and perspires a similar amount.

NASA technicians are testing a system in the advanced Environmental Control System laboratory of the Crew Systems Division. Named the Vapor Compression Distillation Water Recovery System, it turns urine into good water.

For almost a month, the sealed metal device has been fed more than 21 gallons of accumulated urine a week, recovering over 20 gallons of good water.

The urine goes round and round in a revolving drum, held there by centrifugal force where it evaporates at a low temperature (90°F) under low pressure the same as water boiling at lower temperatures and high altitude.

A compressor picks up the water vapor and raises it to a slightly higher pressure behind the rotating drum. As it condenses on the outside of the drum, droplets are slung off into a trough, collected and pumped out as reclaimed water.

Condensation occurs on the outside of the rotating drum separated by thin metal from the inside (evaporating) surface. It runs on the equivalent power of a 50 watt bulb, says Thompson.

NASA last month requested bids from more than a dozen firms for an advanced model of a Vapor Compression Distillation water recovery system.

When delivered, the equipment will be tested in manned and unmanned space chambers at the Johnson Space Center and with other regenerative life support equipment.

"We're looking to recover potable (drinking) water from crewmen, perspiration and wash water at a nominal rate of 3 pounds an hour suitable for reuse in future manned spaceflight," Thompson said.

###

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Dave Alter

For Release

RELEASE NO: 80-055

September 16, 1980

LIGHTER THAN THE LIGHTEST...

STRONGER THAN THE STRONGEST.

IT'S SUPERMETAL!

QUESTION: What metal is lighter, stronger and stiffer than aluminum and carries a lifetime guarantee in space?

ANSWER: Supermetal! Aluminum or magnesium laced with thousands of hair-thin strands of graphite fibers. Technically named, "metal-matrix composites."

Sandwiched between aluminum or magnesium, the feather-light graphite makes the finished materials stronger, about four times more rigid and up to 35 percent lighter.

Unlike other metals in space, the composite also provides thermal stability -- remaining unaffected by heat or cold since graphite-metal matrix composites will not expand or contract significantly.

Because they resist solar radiation and do not "out gas," they are almost indestructible and should function in space indefinitely, said Glenn M. Ecord, senior metals engineer.

- more -



The new supermetals are being developed for space operations of the future. They will be used for large, permanent space structures, antennas, geodetic beams, solar arrays, booms and masts, large mirrors and their supports, and deployable space antennas, said Ecord.

Supermetal composites also promise to benefit construction, the automobile industry and commercial aircraft with lighter and stronger structures.

Although the metal-matrix composite is about 15 years old, aerospace metal specialists about four years ago learned how to produce a high quality material using a special coating to bond the graphite fibers to metal.

First such test hardware is scheduled for delivery by Lockheed to the Johnson Space Center later this year. Lockheed will provide two wave guides -- box-like devices designed to direct microwaves for solar power satellites of the future.

###

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Lyn Cywanowicz

For Release

RELEASE NO: 80-056

September 19, 1980

## 54-HOUR SIMULATION

The next 54-hour mock flight of the Space Shuttle Orbiter Columbia will be held September 23-25 at the Johnson Space Center, Houston.

Launch time is 8 a.m. CDT on Tuesday, and landing for the simulated flight is scheduled for 3 p.m. on Thursday.

Astronauts Joe H. Engle and Richard H. Truly will open and close payload bay doors, navigate and track stars in the Shuttle Mission Simulator. Engle and Truly are the backup crew for Columbia's first flight.

The flight directors for the simulation will be Neil H. Hutchinson, Charles R. Lewis and Donald R. Puddy.

Besides the flight control teams and the astronaut crew, hundreds of engineers, program officials and prime contractor representatives will practice solving problems that might occur during a real mission.

The "flight" is the third of its kind and is designed to help the flight controllers and flight crew refine procedures and techniques that will be used during the Columbia's first flight.

Additional simulations are scheduled before Columbia is launched in March of next year.

###

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Terry White

For Release

RELEASE NO: 80-057

October 1, 1980

## ASTRONAUT GIBSON LEAVES NASA TO JOIN TRW

Scientist-astronaut Dr. Edward G. Gibson will leave the NASA Johnson Space Center effective October 31 to join TRW Defense and Space Systems Group, Redondo Beach, CA as advanced systems manager.

Gibson was selected as an astronaut in June 1965 and was science pilot on the 84-day Skylab 4 mission in 1973-1974. An eminent scientist in the field of solar physics, Gibson is author of the textbook, The Quiet Sun.

He left NASA in 1974 to join Aerospace Corporation as senior staff scientist, and later was consultant to the West German aerospace firm of ERNO Raumfahrttechnik GmbH in Bremen. Gibson rejoined NASA in March 1977

###

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Terry White

For Release

RELEASE NO: 80-058

October 1, 1980

## SPACE CENTER NEGOTIATES FIRE AND SAFETY CONTRACT

The NASA Johnson Space Center has selected Webb, Murray and Associates of LaPorte, TX for negotiations leading to a fire protection and safety support contract at the Center. The contract will cover fire protection engineering, safety engineering, accident investigation, safety training, fire prevention inspection, fire alarm and emergency investigation, and fire protection system maintenance.

Webb, Murray and Associates will employ 27 people under the cost-plus-fixed fee contract which will begin October 15, 1980 and end October 14, 1981. The contract value is estimated at \$700,000.

###

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

John Lawrence

For Release

RELEASE NO: 80-059

Immediate

## 54-HOUR SIMULATION

A 54-hour simulated flight of the Space Shuttle Orbiter Columbia will be conducted Tuesday through Thursday, October 21-23, at Johnson Space Center, Houston.

The exercise begins with simulated liftoff at 8 a.m. Tuesday and concludes with landing at 3 p.m. Thursday.

Purpose of the simulation is to provide the Shuttle astronauts and ground-based flight controllers with realistic training, using the actual flight plan to be employed during the initial flight of Columbia anticipated in March 1981.

Computers and flight simulators contribute an aura of reality by replicating flight conditions and evaluating actions performed by the air and ground crews. Simulated problems will be introduced during the test to accustom the crews to dealing with a variety of potential flight anomalies.

-more-

Flight crew for the simulation will be Astronauts John W. Young and Robert L. Crippen, who are the prime crew for Columbia's first flight. Three crews of the flight controllers working in JSC's Mission Operations Control Room will be headed by Flight Directors Neil B. Hutchinson, Charles R. Lewis and Donald R. Puddy.

Besides the flight control teams and astronaut crew, hundreds of other engineers, program officials and prime contractor representatives will practice dealing with problems which might occur during a real mission.

The simulation is a repeat of a test held last month, which was abbreviated due to problems with the flight simulation facility. This is the fourth in a series of such simulations. Four more are scheduled through February.

####

October 17, 1980

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Lyn Cywanowicz

For Release

RELEASE NO: 80-060

Immediate

## SPACE SHUTTLE TO CARRY SPACE TOOLBOX

Mechanics won't make house calls in space!

But astronauts will.

A Space Shuttle tool kit will be aboard the orbiter

Columbia next year.

The tool kit includes a tube cutter, winch, three-point latch tool and a center-line latch tool. They will help crew members close and lock the huge payload bay doors.

Although the tools remotely resemble those used by handymen on Earth, they are far more sophisticated. They must perform in the gloved hand of an astronaut in a bulky spacesuit in the weightlessness of space. The crewman will steady himself with one hand and operate the tools with the other.

Strong, durable, and lightweight as possible, each tool must withstand temperatures ranging from  $-190^{\circ}$  to  $267^{\circ}\text{F}$ .

-more-

While engineers improved early designs, astronauts tested prototypes in JSC's neutral bouyancy water tank. After a year, production plans were delivered to Grumman Aerospace in Houston.

The cutter, which resembles an oversized wrench, will snip obstructions that prevent the big doors from shutting.

The winch actually "reels in" the doors and latch tools (resembling giant vise grips) secure and lock them.

The flight tools are ready to be stored aboard the Columbia just in case the space "handy men" need them to make repairs.

###

October 14, 1980



# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Dave Alter

For Release

RELEASE NO: 80-061

Immediate

## SPACESUIT LIFE SUPPORT SYSTEM ENDS 14-HOUR TEST

A Shuttle spacesuit life support system has successfully completed 14 hours of manned tests at the Johnson Space Center, simulating spacewalks and certifying the unit for vacuum conditions.

The tests required the suited subject to exercise at the highest rates expected during extravehicular operations. They proved the caution and warning system's ability to sense problems.

The testing follows a flash fire April 18 in the spacesuit secondary oxygen pack in which a Hamilton-Standard technician was burned during a malfunction. Redesign of the high pressure oxygen system resulting from this accident will be certified early next year in a separate test series.

7

###

October 16, 1980

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Dave Alter

For Release

RELEASE NO: 80-062

## SUN POWER KIT PROPOSED FOR SHUTTLE

A portable power and light station could pump converted solar energy into the Space Shuttle Orbiter, doubling electrical power and allowing month-long missions at a savings of millions of dollars, NASA engineers said in Houston.

Named the Power Extension Package (PEP), the Shuttle solar cell array concept was developed at NASA's Johnson Space Center. It could be carried into space aboard the Orbiter, to be unraveled from its accordion fold into a 240-foot gossamer-like double wing.

Early Shuttle flights will receive electric power from three hydrogen-powered fuel cells offering payloads a maximum sustained 7 kilowatts (7,000 watts) for 7-day flights.

Length of early missions will be limited by the amount of fuel cell cryogenics (liquid hydrogen and liquid oxygen) also used for power during Earth orbit eclipse (on the dark side of each orbit).

-more-

October 28, 1980

"A Power Extension Package would increase to 15 kilowatts (15,000 watts) the electricity available to payloads and could lengthen missions to 45 days during maximum sunlight with the addition of crew consumables," said Jerry W. Craig, project manager.

"Compare this to adding fuel cell oxygen and hydrogen tanks weighing about 1,000 pounds a day of added duration, with no increase of power."

The additional available power would allow a 400 percent increase in experiments for seven flights including a German Space Agency payload-- the first non-NASA Spacelab flight--Spacelabs 3 and 4 and two Department of Defense payloads. Depending on the number of experiments and their power requirements, it could double or triple the number of experiments flown, providing at least four times as much data, said Craig.

The additional power in these missions would reduce fuel cell maintenance costs by about \$5 million and save an additional \$15 million in fuel cells. The first five years of operations would save more than \$300 million.

The PEP kit, weighing less than 2,100 pounds, would be stored in an unused area above the Spacelab tunnel. It is a large flexible folded solar-cell array that is deployed from the cargo bay by the Orbiter Remote Manipulator System (RMS), refolded and stowed at the end of each mission.

The PEP kit travels with the Orbiter and operates at any altitude, making it ideal for other sortie operations.

When the orbiting vehicle is in sunlight and PEP is operating, fuel cells idle and conserve fuel.

In operation, the PEP kit is an extension of basic Shuttle Orbiter power system. It provides solar-generated electricity direct to common junctions between electrical circuits (bus-bars) and could provide up to 15 kilowatts to any payload or payload carrier.

The PEP kit includes a tracker that keeps twin solar array "wings" locked onto the Sun in any Orbiter orientation. Raw solar power is converted to regulated voltage.

###

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

John Lawrence

For Release

RELEASE NO: 80-063

Immediate

## 56-HOUR SIMULATION

The fifth in a series of long-duration simulations of the first flight of the Space Shuttle Orbiter Columbia will be conducted at Johnson Space Center, Houston, Tuesday Through Thursday, Dec. 2-4.

The 56-hour exercise begins with simulated liftoff at 8 a.m. Tuesday and concludes with landing at 4 p.m. Thursday.

Flight crew for the test will be Astronauts Joe H. Engle and Richard H. Truly, the backup crew for Columbia's first flight. Three flight control teams will work in JSC's Mission Operations Control Room under Flight Directors Neil B. Hutchinson, Charles R. Lewis and Donald R. Puddy.

Purpose of the simulation is to provide Shuttle astronauts and ground based flight controllers with realistic training, using the actual flight plan to be employed during the initial flight of Columbia, anticipated in March 1981.

-more-

November 26, 1980

Computers and flight simulators provide an aura of reality by replicating flight conditions and evaluating actions performed by the air and ground crews. Simulated problems will be introduced during the test to accustom the participants to dealing with a variety of potential flight anomalies.

Beside the flight control teams and astronaut crew, hundreds of other engineers, program officials and prime contractor representatives will practice dealing with problems which might occur during the real mission.

###

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

John Lawrence

For Release

RELEASE NO: 80-064

December 5, 1980

## SHUTTLE-ERA SPACE SUIT

Space suits for astronaut use during the Space Shuttle era will be significantly different from those used in previous manned space flight programs.

The Extravehicular Mobility Unit (EMU), as the suit and its life support system are more formally known, is under development and testing at NASA's Johnson Space Center, Houston.

Development has had the principal objective of facilitating zero gravity environment and greater upper body mobility for Shuttle astronauts. It will be worn during extravehicular activity (EVA) by astronauts, when they leave the Shuttle orbiter during space flight and perform functions in the hostile vacuum of space. Such activities will encompass a wide variety of construction, repair and checkout procedures and will require a substantial range of mobility and dexterity.

EMU development dates to 1976 and involves NASA engineers working with the contractor, Hamilton Standard, Inc., and its major subcontractor, International Latex Corp. This research team also includes Astronauts Story Musgrave, Anna Fisher and George Nelson.

-more-

Astronaut Nelson said that the more critical areas of EMU development have been the shoulder configuration and the gloves.

"The shoulder arrangement has been crucial because of the complete range of gimbaling action required," Nelson said. "And of course the necessity for suit integrity."

The solution was found in the design of a "rolling convolute" --- an "S"-shaped fold of fabric where the sleeve is coupled to the hard upper torso of the suit. The arrangement permits complete freedom of motion for shoulder rotation.

The importance of comfortable and pliable gloves is related to the necessity for working with tools and other hand manipulations required during EVAs. One complicating factor has been that the resistance of the gloves produces hand fatigue. Suits are pressurized to four pounds per square inch. Nelson likens the effect to "squeezing a balloon." And because of the effort required, glove comfort is critical.

"Any flawed seam, irritation or pressure point can quickly cause soreness," Nelson said. Consequently sizing, seam location and the configuration and placement of wrist and digit flex points has been a critical feature of designing the gloves.

Fifteen glove sizes are available to Shuttle astronauts. They permit enough dexterity, Nelson says, to pick up a dime --- "given enough time." Nelson characterized working in the gloves to be about as difficult as trying to work without using your thumbs.

Another unique feature of the suit is its "adjustable fit" concept. Suits used in previous NASA programs were custom-made for each astronaut --- a long and costly process. The Shuttle EMU is composed of sections which are pieced together in various combinations to accommodate different astronaut body sizes.



In addition to the range of glove sizes, there are five upper body sizes, three lower torsos and a selection of upper arm, lower arm and waist section sizes.

Rather than having a custom suit for each of the more than 80 astronauts and astronaut candidates currently assigned to NASA, they will share suit pieces. Astronauts are measured for fit and when a suit is required it is built from off-the-shelf pieces. It is subsequently disassembled and the pieces returned to storage for re-issue to others.

The EMU weighs slightly less than 300 pounds, which is comparable to the Apollo-era suits. However, it takes just 15 minutes to put on the EMU, compared to over an hour for earlier suits.

A portable life support system is incorporated into the suit and can sustain an astronaut for up to six hours. Following that, replenishment of consumables and batteries can be quickly accomplished back on board the orbiter.

As an undergarment, astronauts will wear a liquid-cooled, vented garment. This mesh, one-piece unit serves to remove metabolic heat produced by the astronaut. It also ventilates the limbs with air which travels through a harness to the inside front of the hard upper torso of the EMU, where it connects to the life support subsystem.

Development of the life support system to accommodate the astronaut in a zero gravity environment has also been a challenging aspect of EMU research. In addition to suit pressurization and ventilation, the system provides a constantly refreshed atmosphere for crewmember breathing. The system has light-emitting diode displays and a caution-and-warning system for alerting the crewman to any system failure or abnormal condition with the life support or communications equipment.

This portable life support system is attached to the back of the hard upper torso of the EMU. Displays and controls are attached directly to the front of the EMU, and allow the crewmember to control and monitor the system.

###

Note to Editors:

Photos are available upon request.

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Dave Alter

For Release

RELEASE NO: 80-065

Immediate

## NASA ANNOUNCES NEW FIRE RESISTANT MATERIAL FOR AIRCRAFT

A spongy, light-weight material that resists ignition up to 800 degrees fahrenheit and even then only chars and decomposes, has been developed for NASA's Johnson Space Center in Houston, safety experts said here .

The new, flame-resistant material, named "polyimide resilient foam," could reduce in-flight fires and lengthen airline passenger evacuation time from two to five minutes for a survivable crash complicated by an external fuel fire.

Accident statistics given the House of Representatives 96th Congress in 1979 showed that from 1969 through 1978, there were 16 survivable crashes in which 419 passengers (22 percent) died in fires. This was 68.5 percent more than the 287 who died during impact in the same crashes. The data was presented in hearings before the subcommittee on oversight and review of the Committee of Public Works and Transportation.

December 11, 1980

-more-

Four polyimide double seats will be supplied for test and evaluation by the FAA in a C-133 aircraft at its technical center in Atlantic City, NJ.

Polyimide foam is being suggested as a replacement for polyurethane used in aircraft seat cushions, which represent the largest amount of flammable material in airline interiors. Since the new polyimide does not outgas until it begins to char at the approximate 800 degree temperature, it is safer from toxic fumes produced by polyurethane at ignition.

It is not only safer, say NASA fire safety experts, but also provides an estimated 50 percent weight savings.

By varying the ingredients of polyimide, the material hardens and can be used as light-weight wallboard or high-strength rigid floor panels while retaining its fire resistance. As thermal-acoustical insulation with polyimide foam, wallboard could act as thermal or fire barriers, reducing the cabin interior heat load and preventing other flammable materials from igniting.

Manufacturers of commercial aircraft and airline companies have sought improved fire-resistant materials since the early 1960's. By the late 1960's, NASA had developed some fire-resistant materials for the Apollo spacecraft and Skylab vehicle.

The Technology Utilization Office at NASA in Washington recommended these materials be made available to the public, particularly the aircraft industry, which failed to adopt them because they lacked durability, were not commercially available and cost too much to produce. Further development in the Technology Utilization program effort resulted in development of polyimide resilient foam, produced for NASA by the Solar Division of International Harvester, San Diego.

# NASA News

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058  
AC 713 483-5111

---

Dave Alter

For Release

RELEASE NO: 80-066

December 3, 1980

## NOTE TO EDITORS

Dr. Robert A. Frosch, outgoing NASA Administrator, will meet with the press at 11 a. m. Monday (Dec. 8) at Johnson Space Center, Houston. Dr. Frosch in October announced plans to leave his post as Administrator of NASA Jan. 20.

The conference will be held in Room 135, Bldg 2. Before meeting the press, he will meet with JSC's senior staff and later bid farewell to JSC employees. After the conference, he will attend a luncheon at the Gilruth Center.

Dr. Frosch will be taking over as first president of the American Association of Engineering Societies (AAES), a federation of the major engineering societies in the U. S.

###